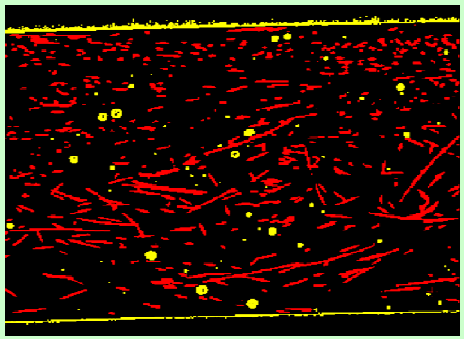
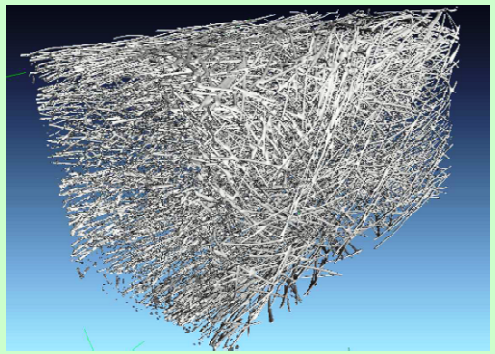
21th Conference "Rheology of Building Materials„
29.02 - 01.03.2012, Univ. of Applied Science

THE RHEOLOGICAL PROPERTIES OF STEEL FIBRE REINFORCED SELF-COMPACTING CONCRETE





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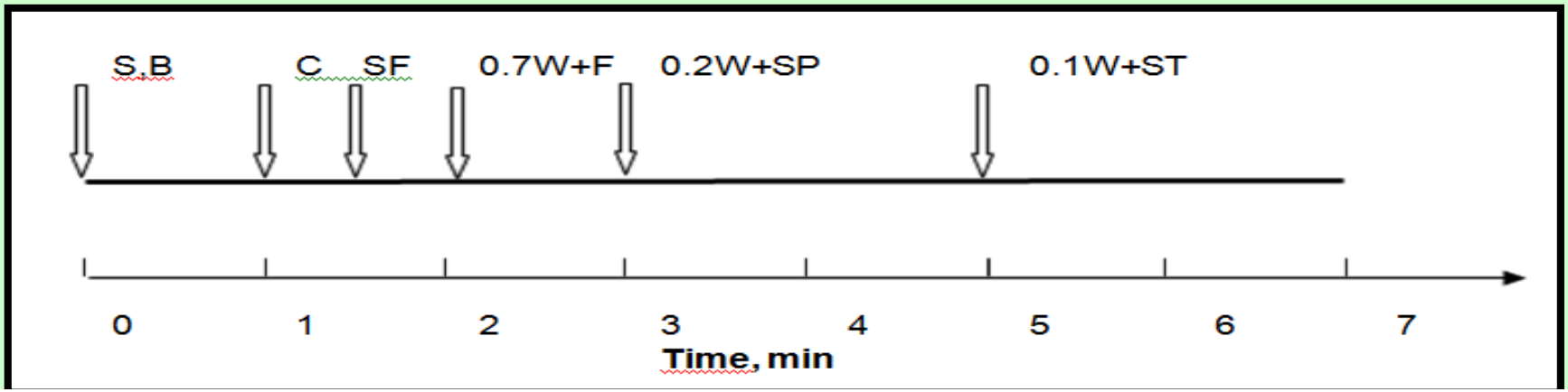
INNOWACYJNA GOSPODARKA
NARODOWA STRATEGIA SPÓJNOŚCI

UNIA EUROPEJSKA
EUROPEJSKI FUNDUSZ
ROZWOJU REGIONALNEGO

MATERIALS AND MIXING PROCEDURE

Component	Symbol	Content
CEM I 42,5 R	C	490,0
Sand 0–2 mm	S	756,0
Basalt 2–8 mm	B	944,4
Silica fume	SF	49,0
Water	W	226,4
Steel fibres – kg/m^3 (% by volume)	F	20 – 180 (0.25 – 2.25)
Superplasicizer Glenium ACE 48 (3.5 % m.c.)	SP	17,0
Stabilizer RheoMatrix (0.4 % m.c.)	ST	1,6
W/(C+SF)	-	0,42
Slump-flow (SF)	-	SF3



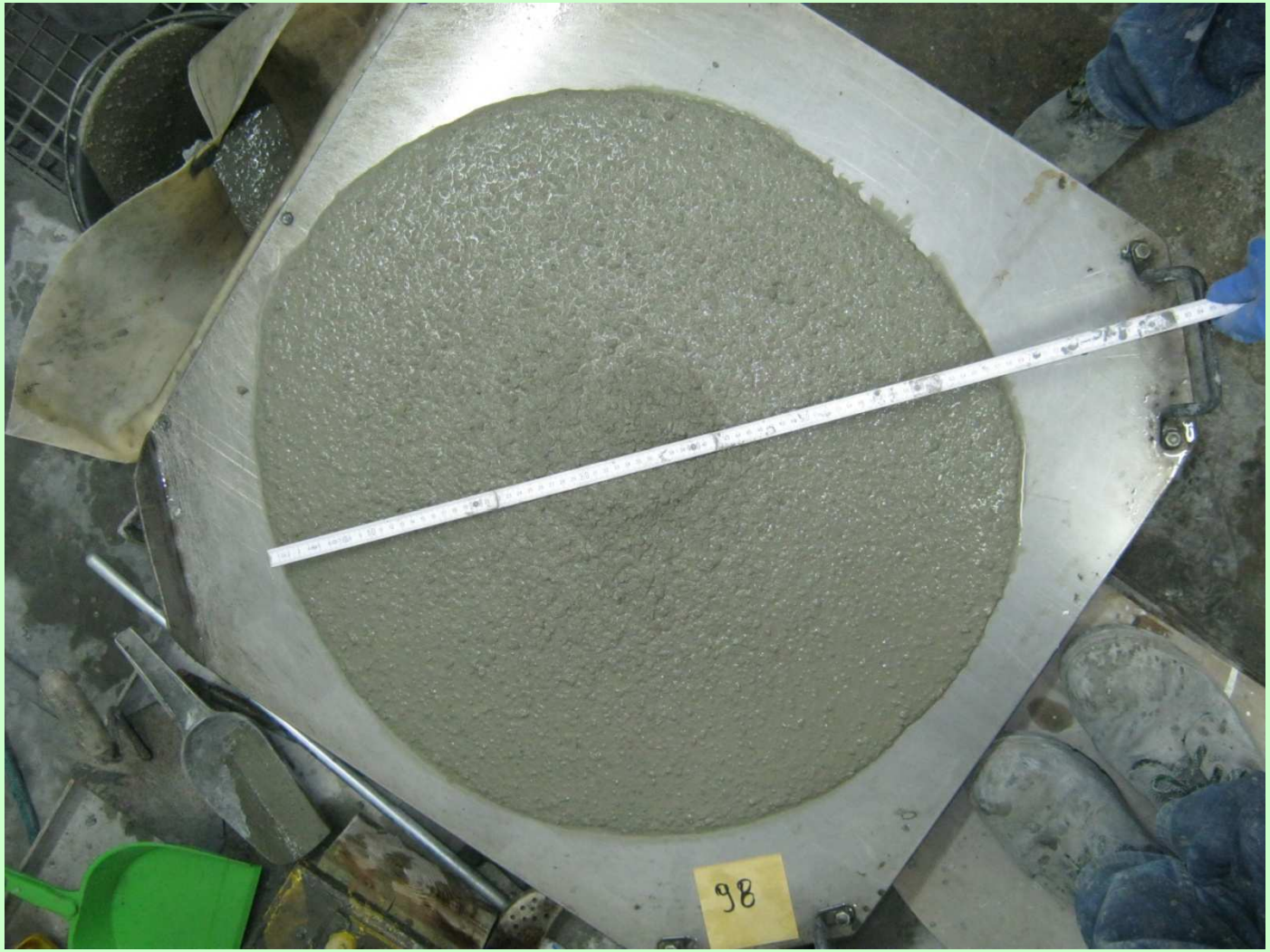
MATERIALS – STEEL FIBRES

No.	Name	Length (mm)	Diameter (mm)	Cross-section	Material	Tensile strength (N/mm^2)
1	DM 6/0,17	6±10%	0,17±10%	circular	low-carbon steel	2100±15%
2	KE 20/1.7	20±10%	1,70±10%	rectangular	DC01	770±15%
3	ST 30/0.5	35±10%	2.30±2.95	part of circle	low-carbon steel	800±15%

SLUMP-FLOW TEST

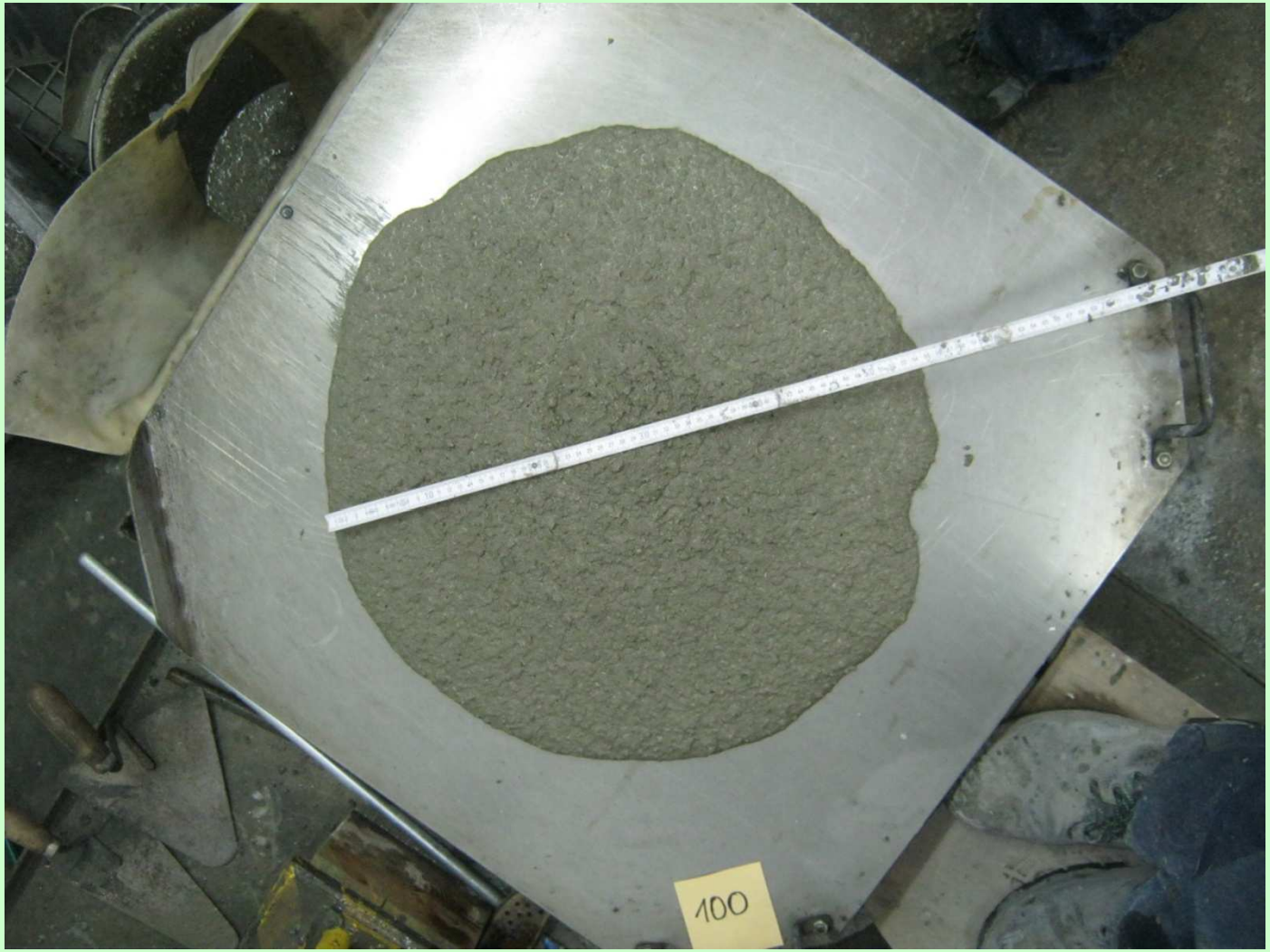
Without fibres – D_{max} = 770 mm

SLUMP-FLOW TEST



DM 6/1.7 – 80 kg/m^3 – D_{max} = 670 mm

SLUMP-FLOW TEST

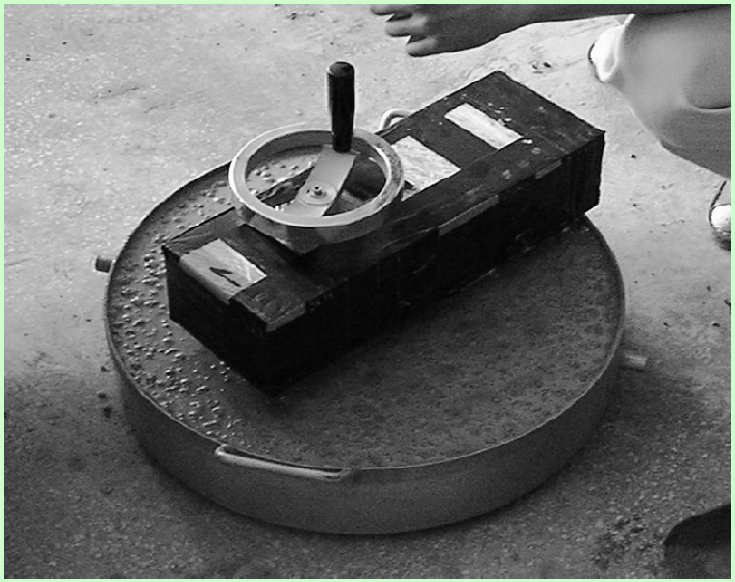


DM 6/1.7 – 120 kg/m^3 – D_{max} = 570 mm

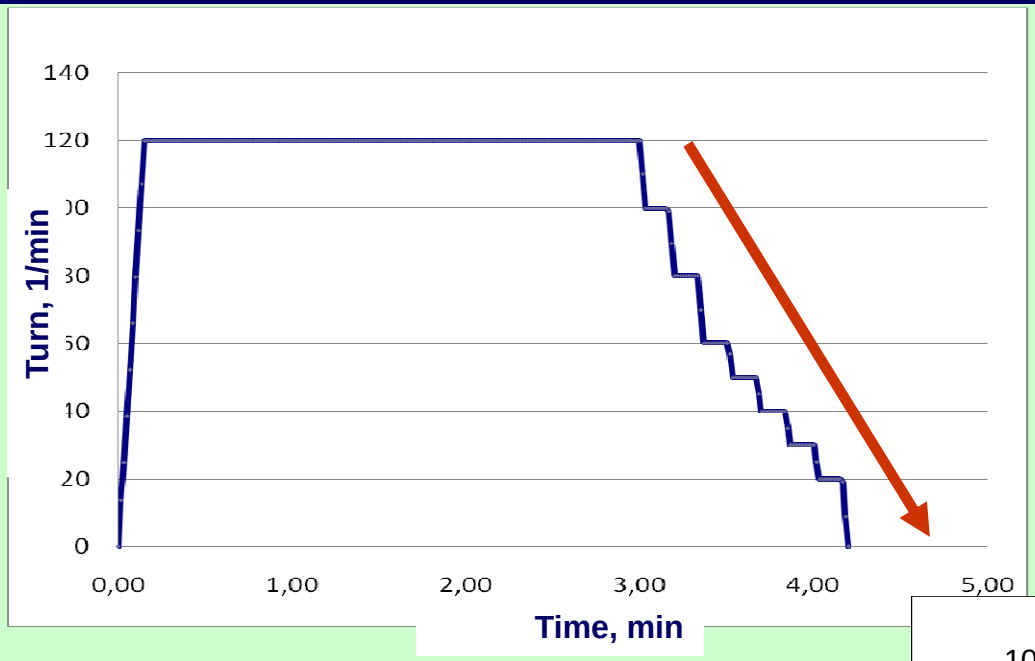
SLUMP-FLOW TEST

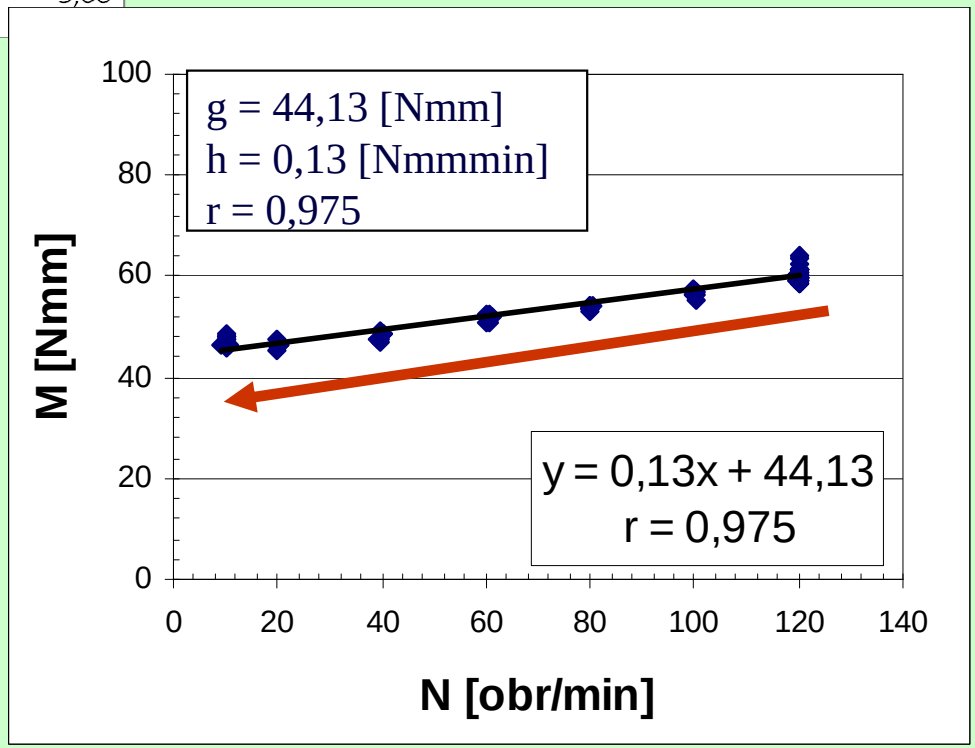
KE 20/1.7 – 120 kg/m^3 – D_{max} = 690 mm

MEASURING PROCEDURE AND THE ROTARY RHEOMETERS

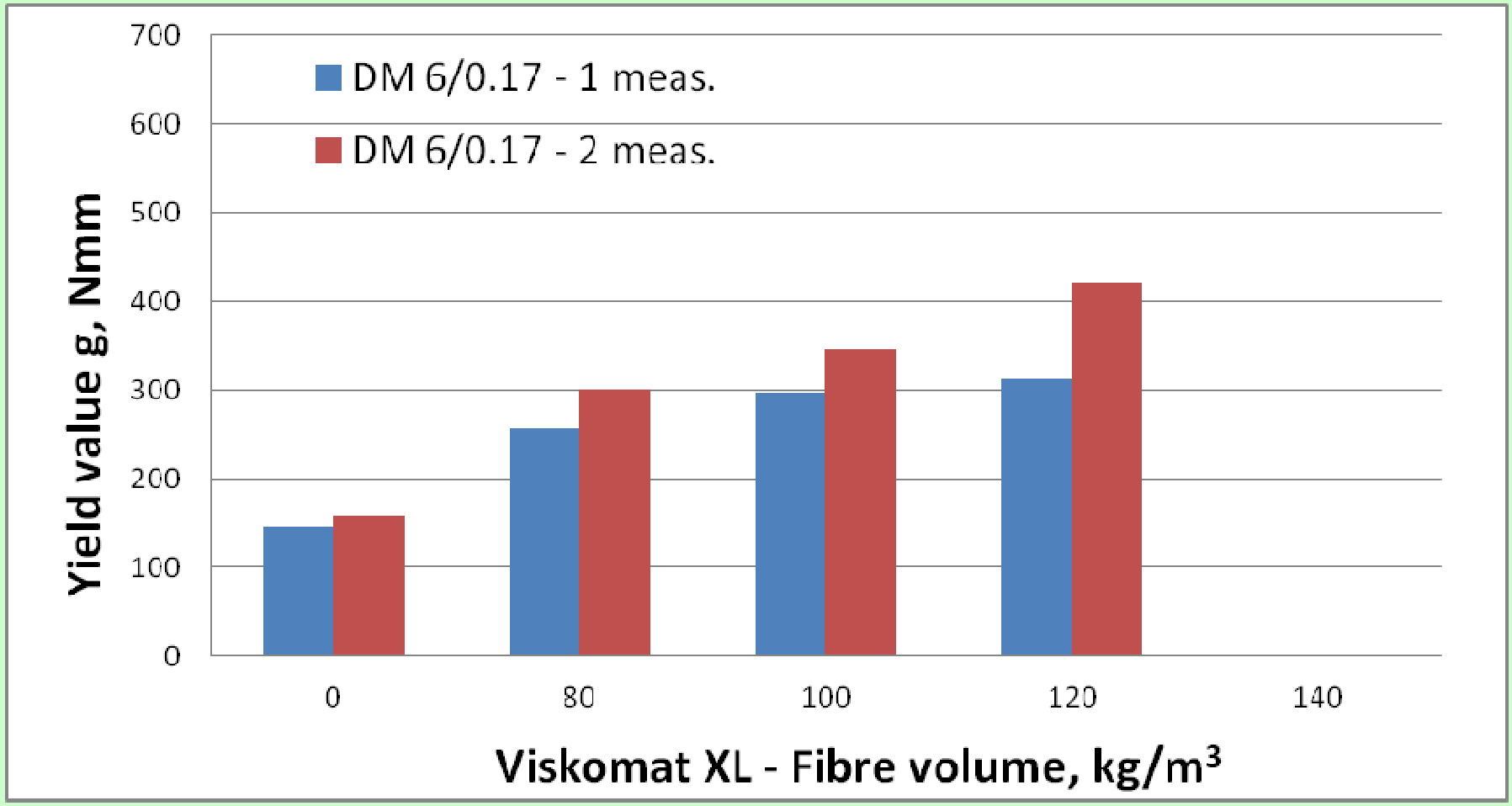


MEASURING PROCEDURE AND THE ROTARY RHEOMETERS

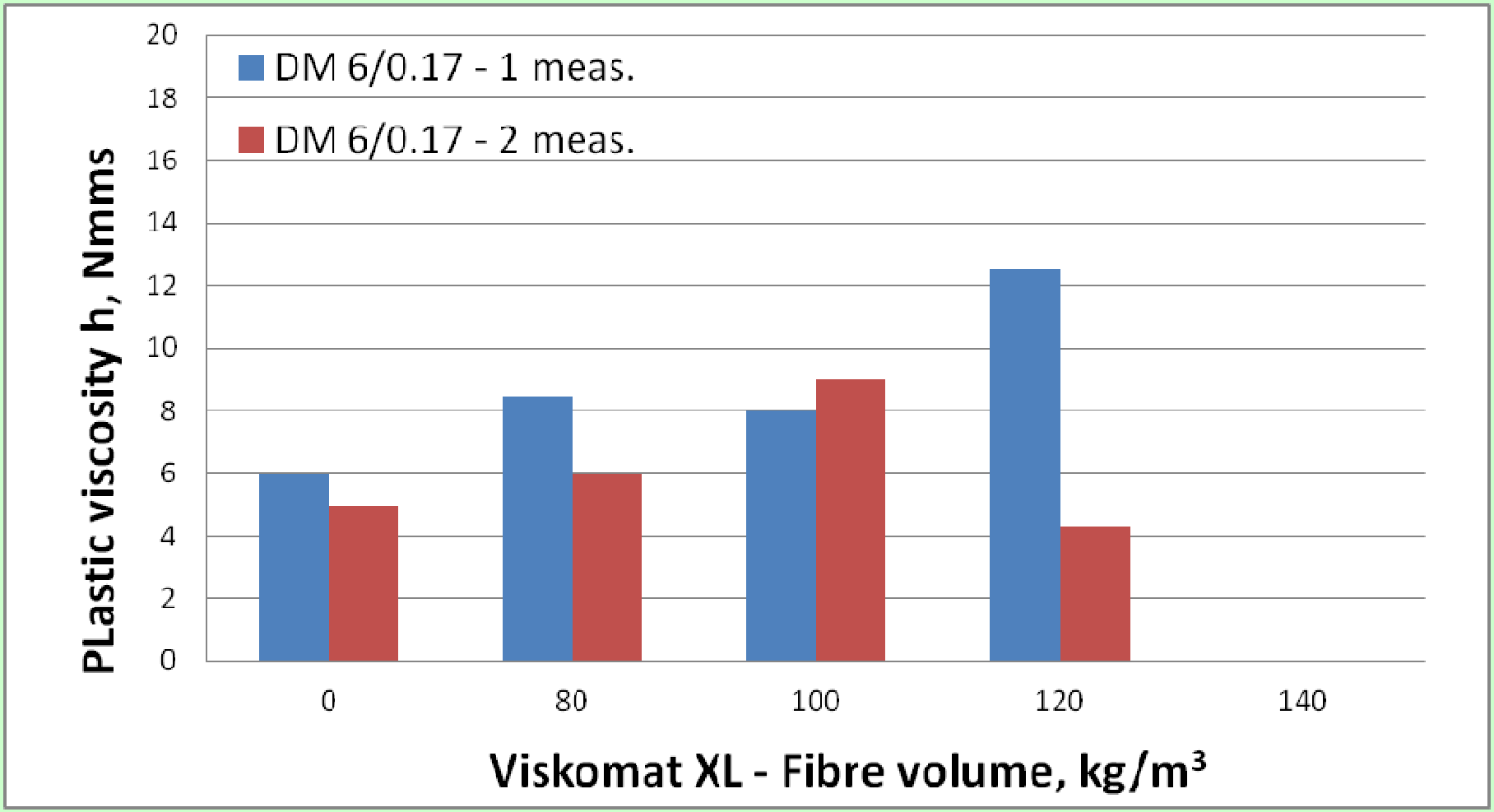




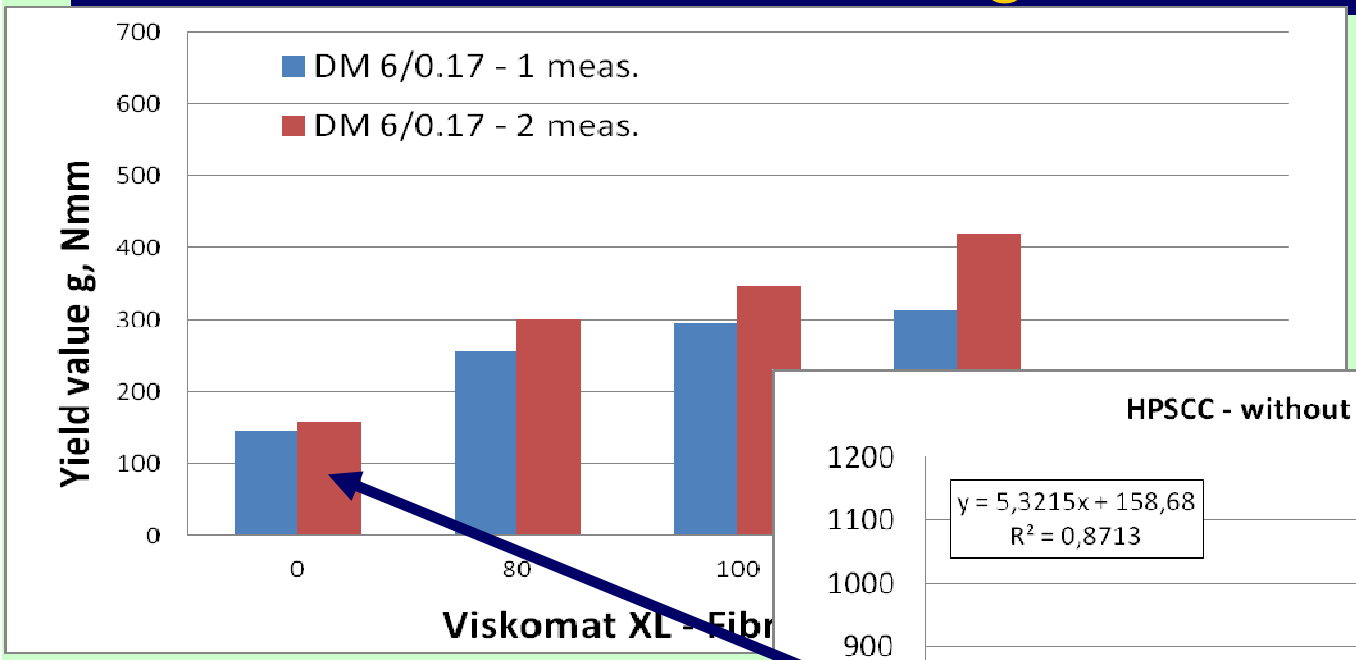
DM 6/0.17 - Yield value g, Nmm

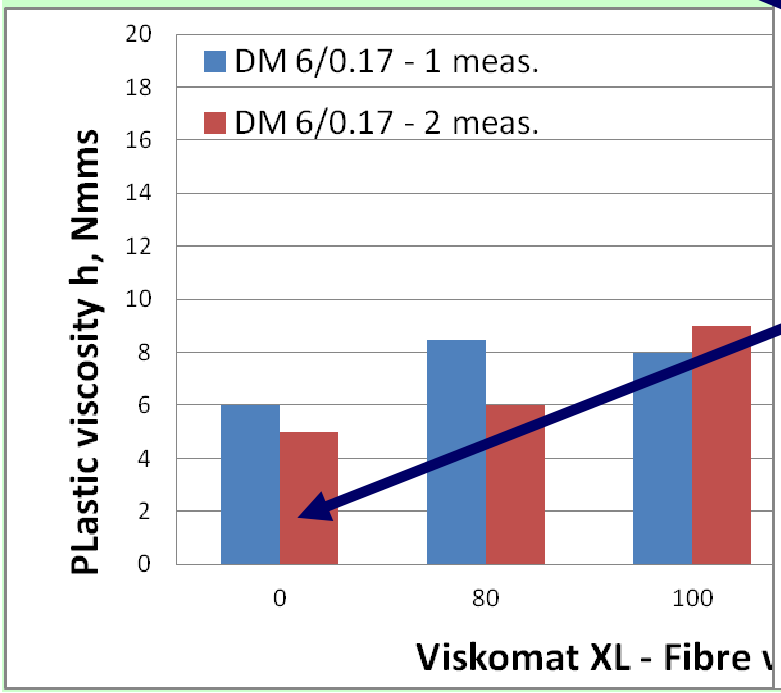


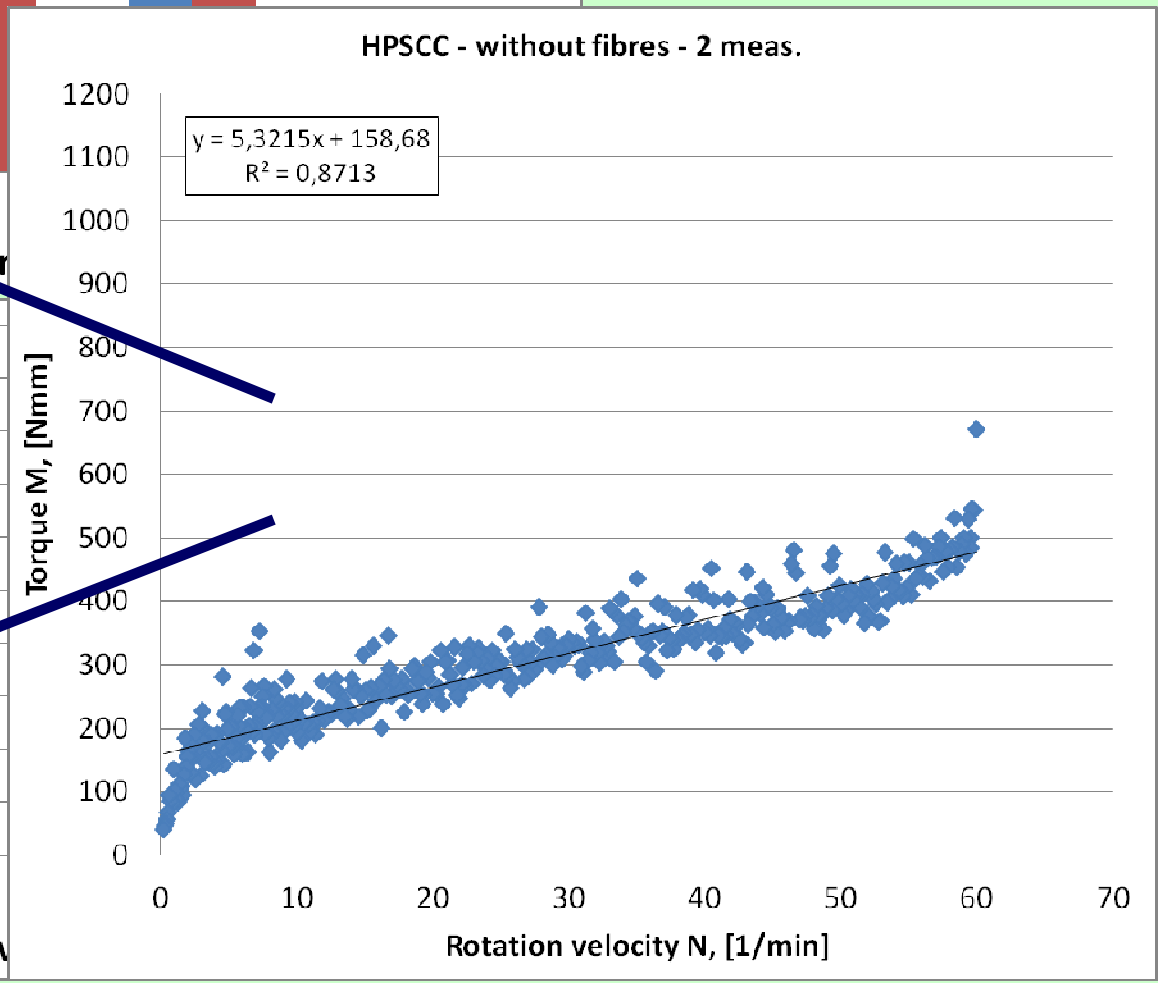
DM 6/0.17 – Plastic viscosity h, Nmms



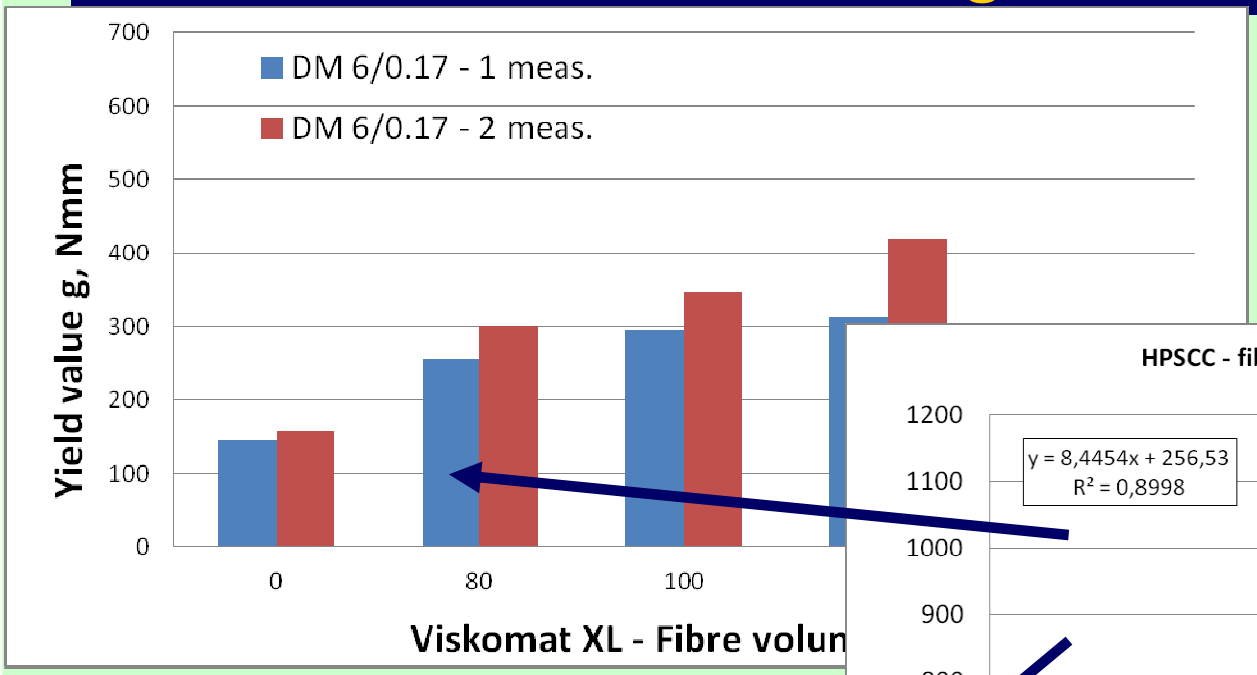
DM 6/0.17 - - g & h values

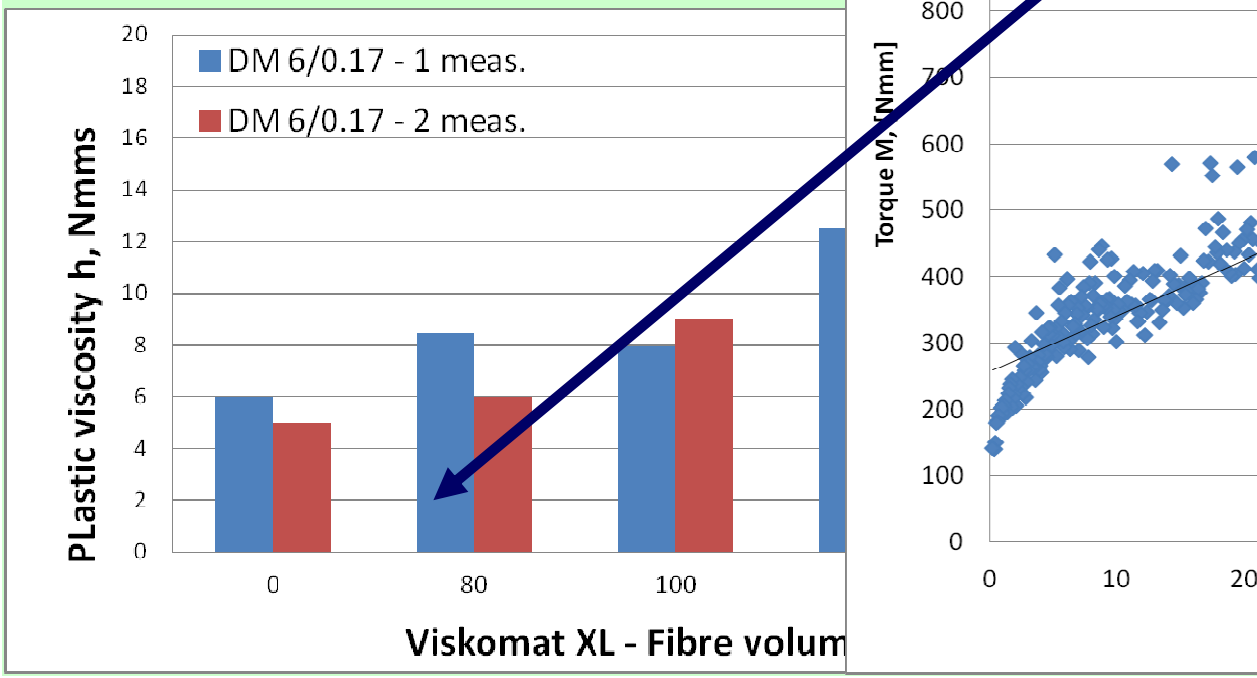


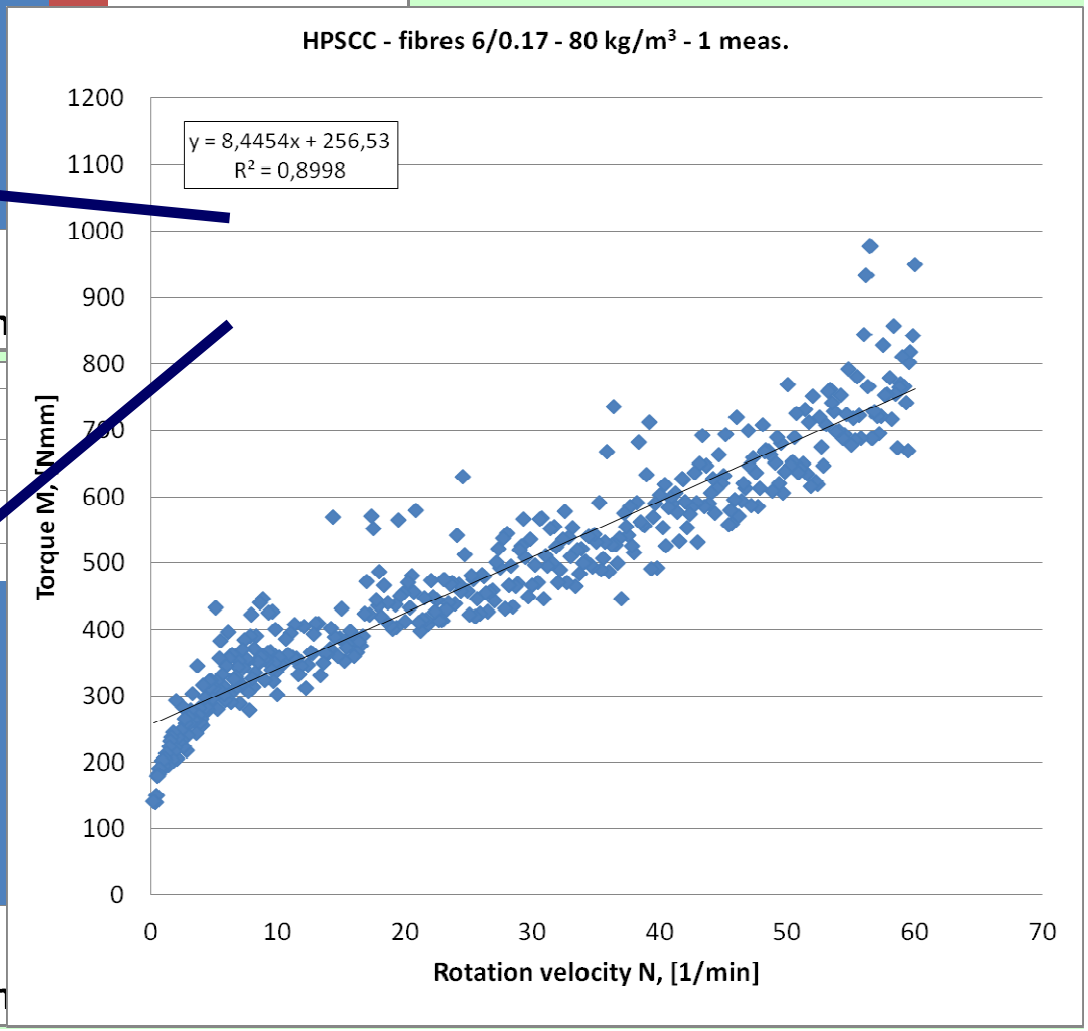




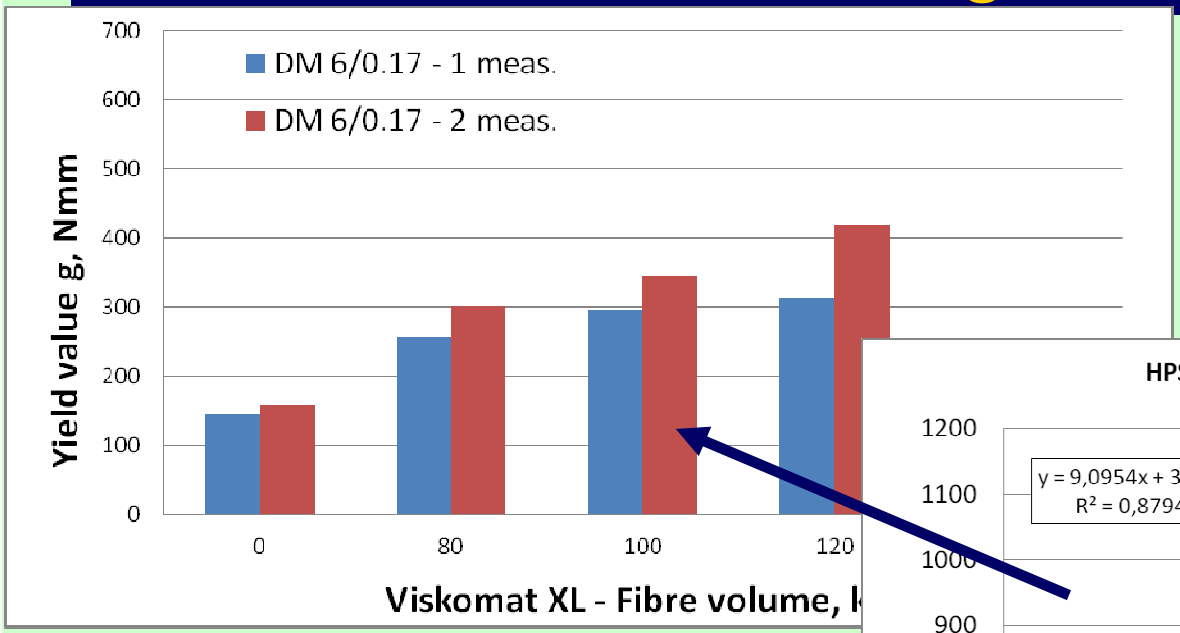
DM 6/0.17 - g & h values

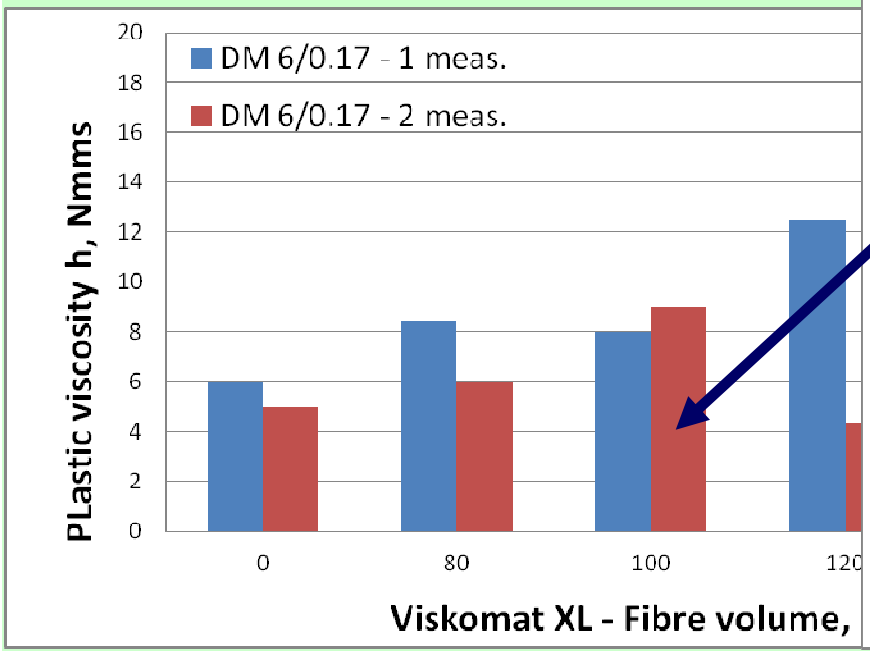


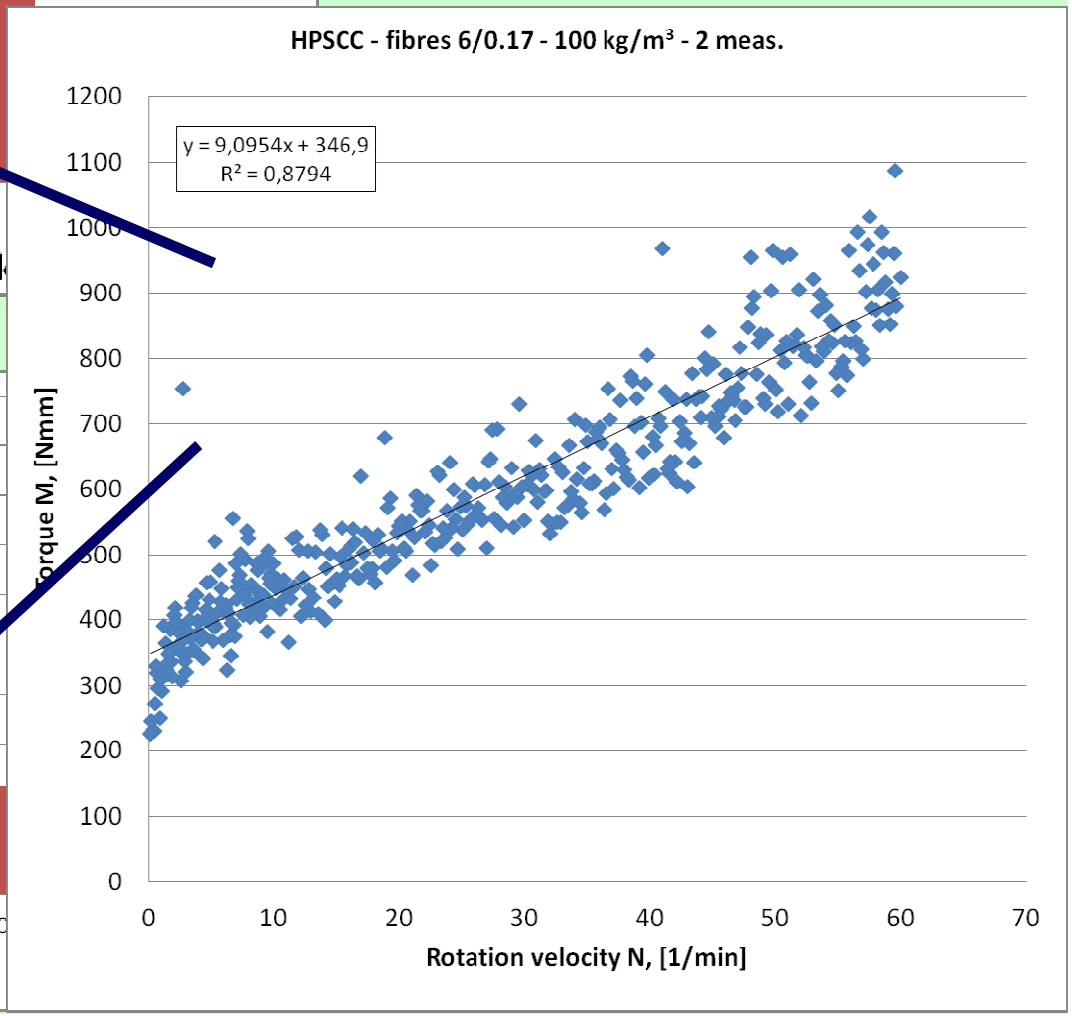




DM 6/0.17 - g & h values







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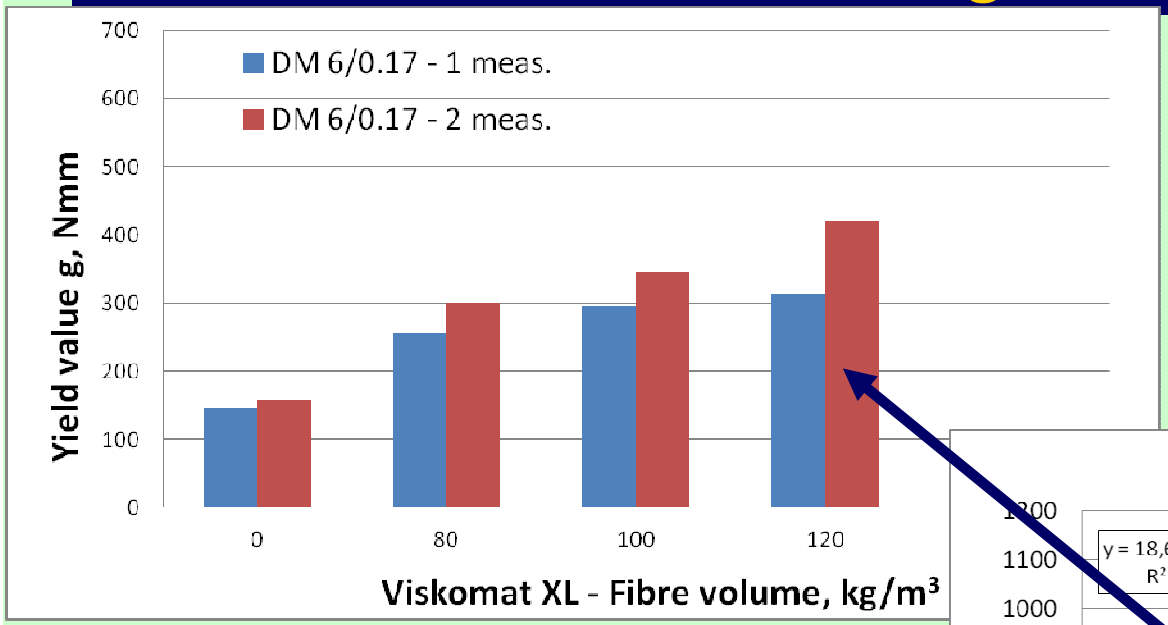
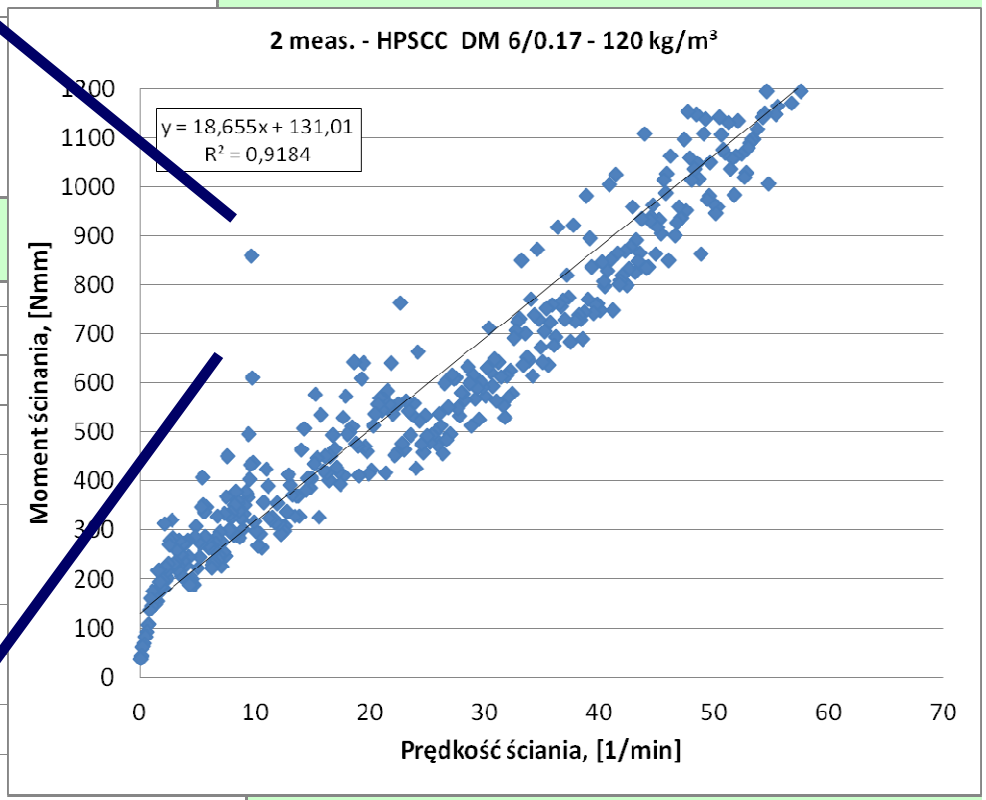
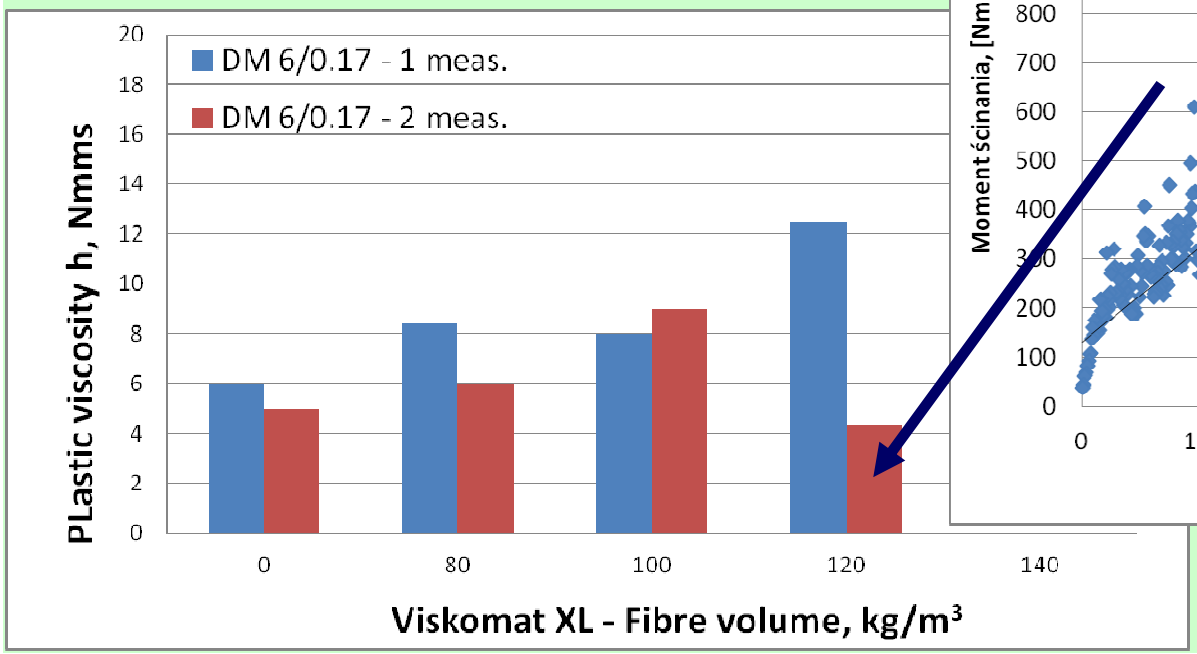
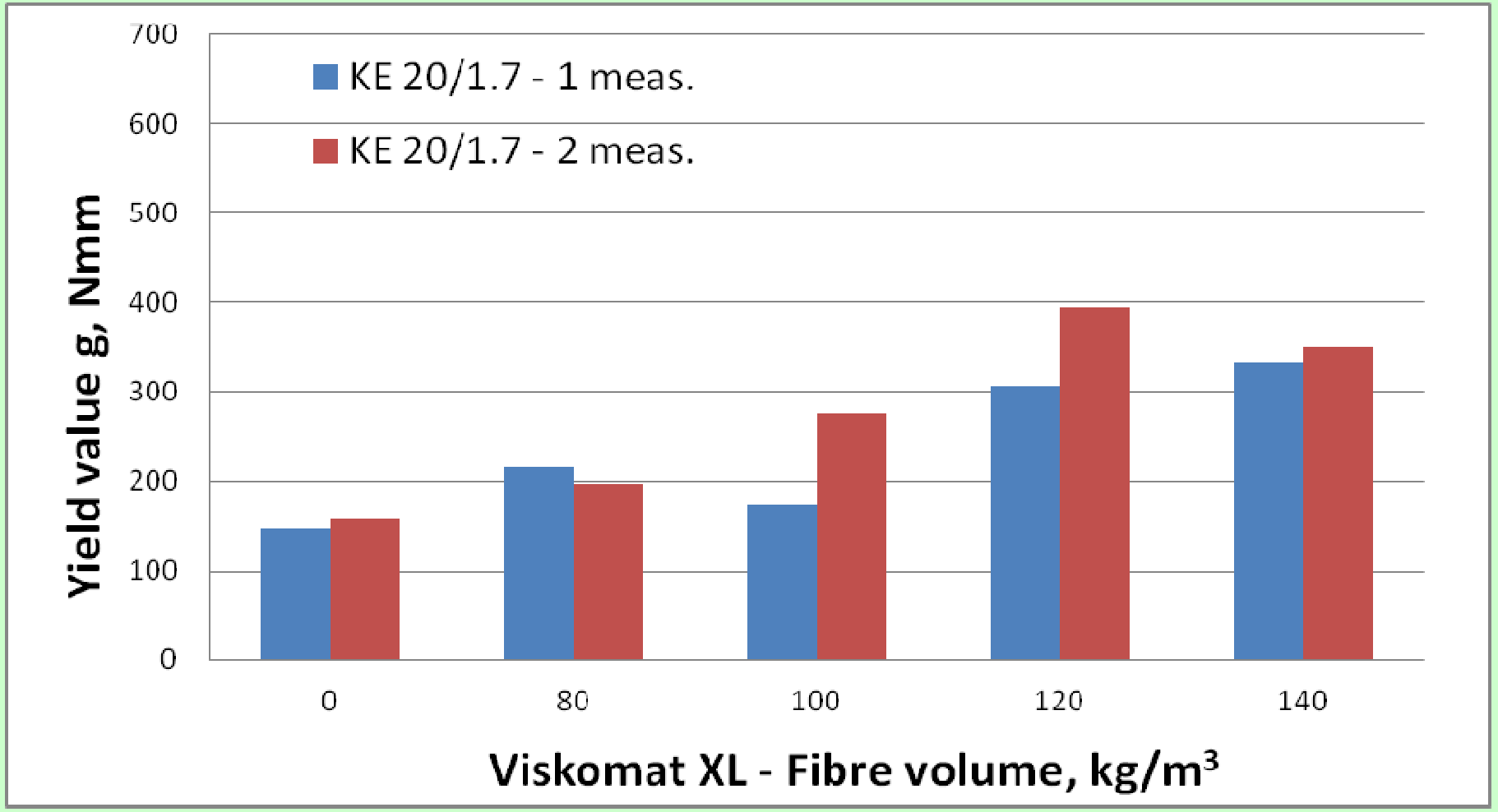


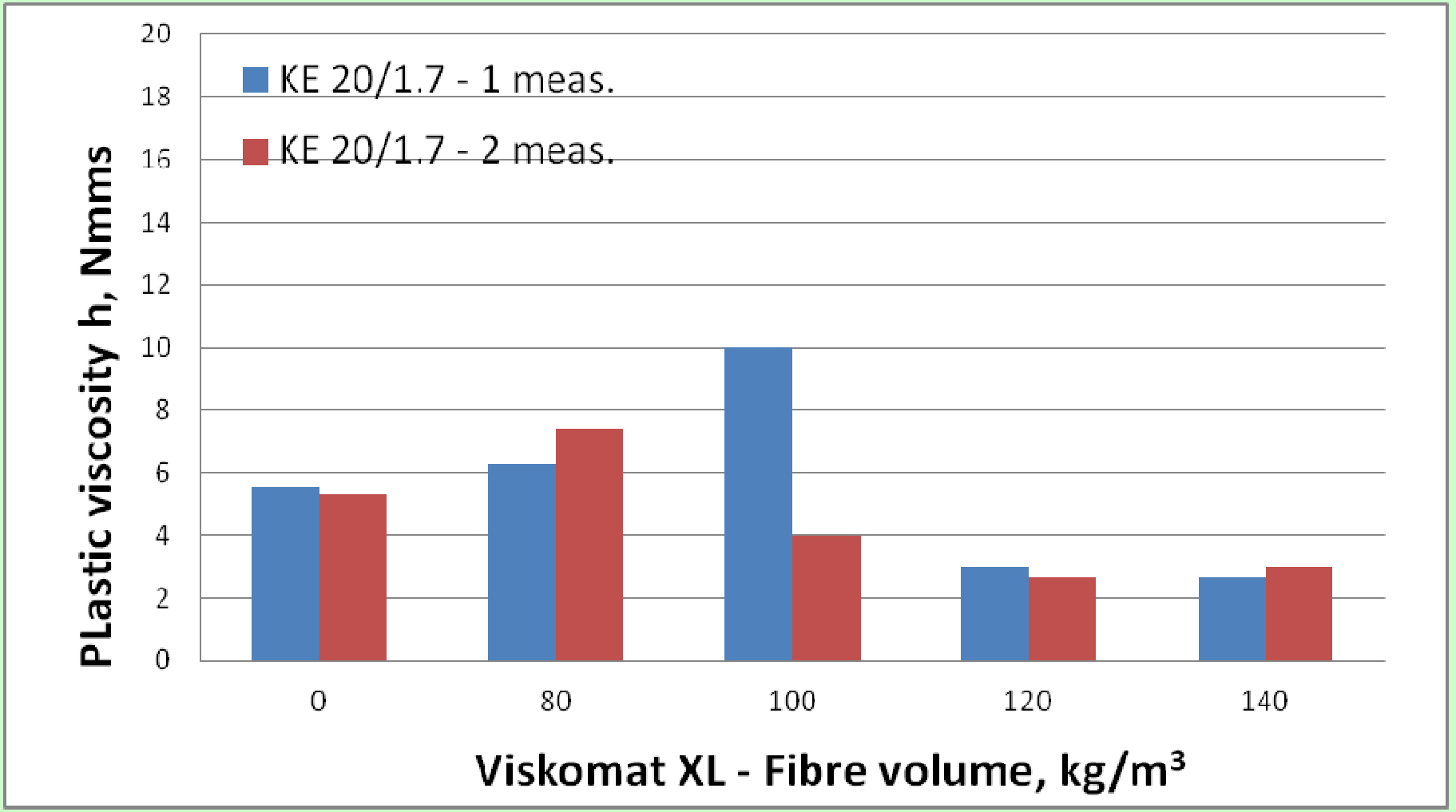




KE 20/1.7 - Yield value g, Nmm



KE 20/1.7 - Plastic viscosity h, Nmms



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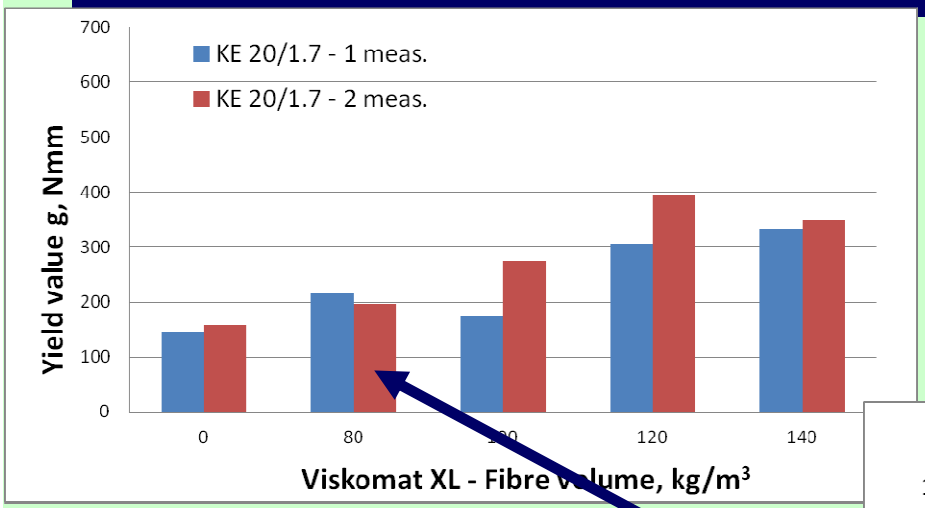
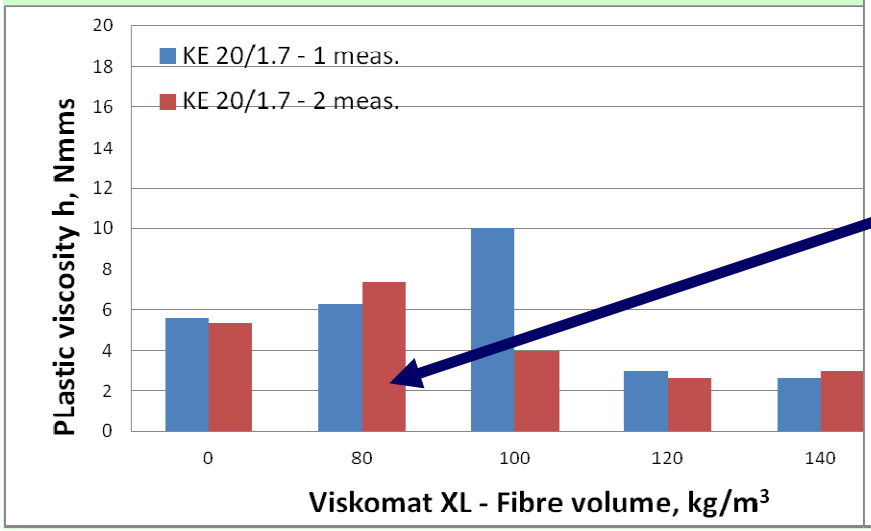
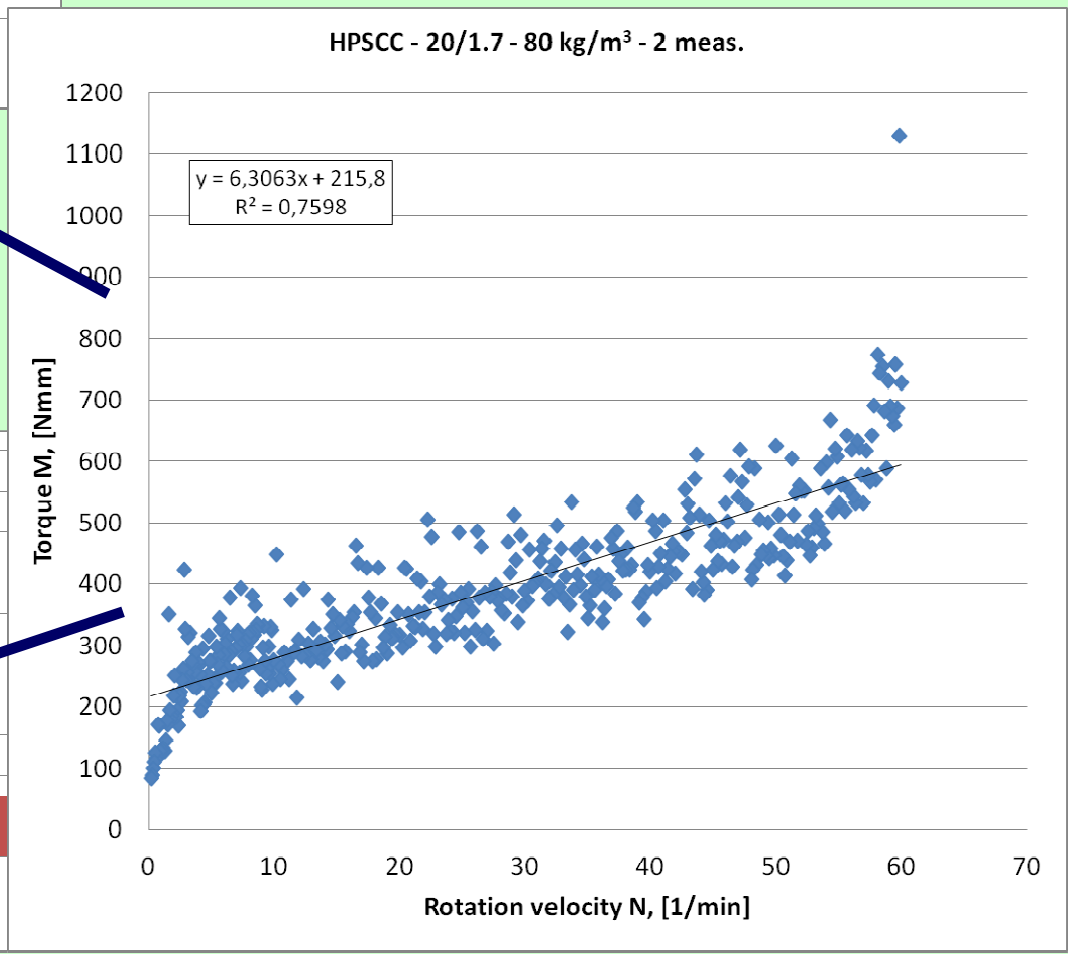
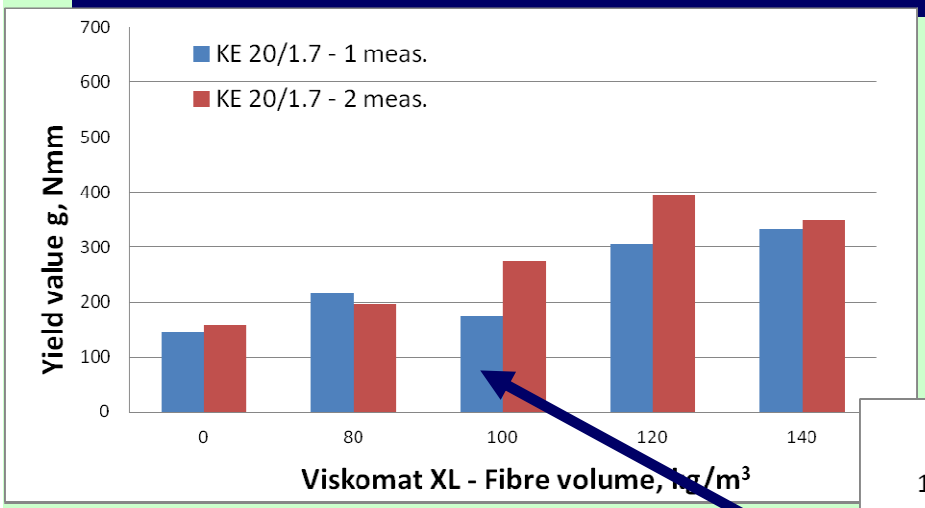
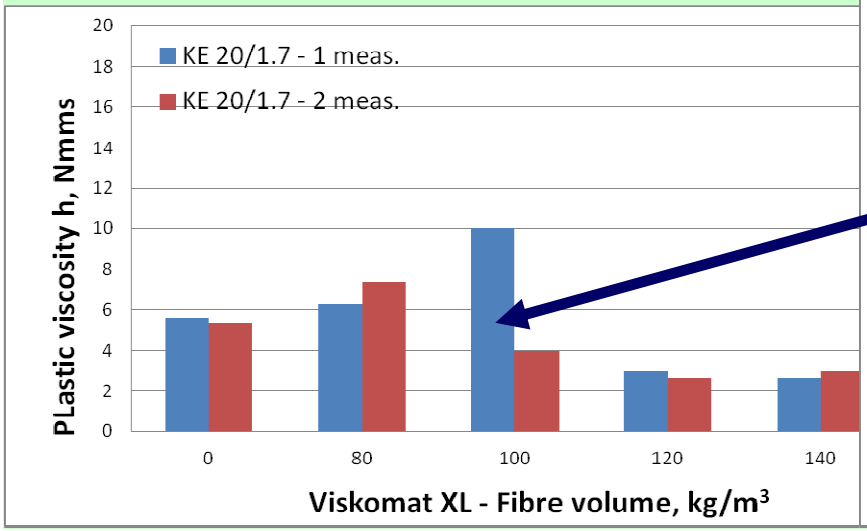


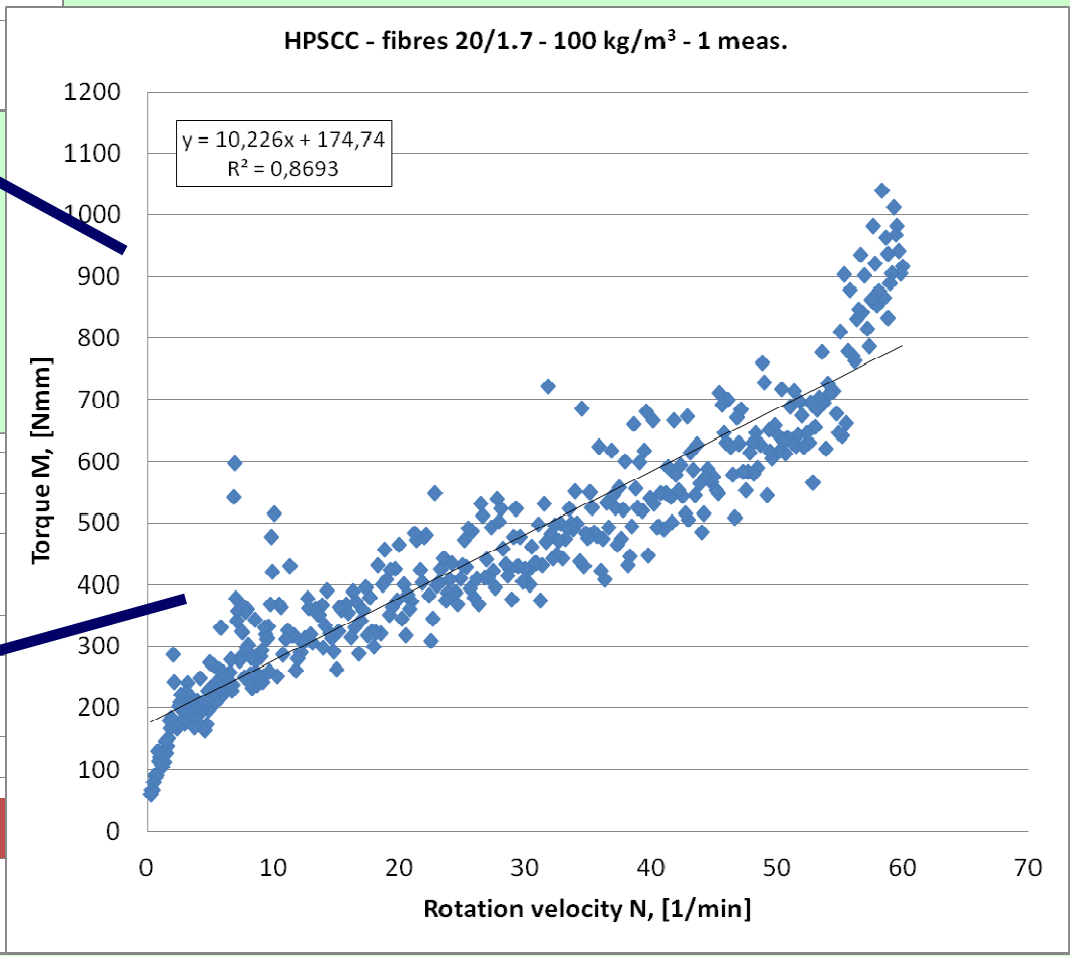




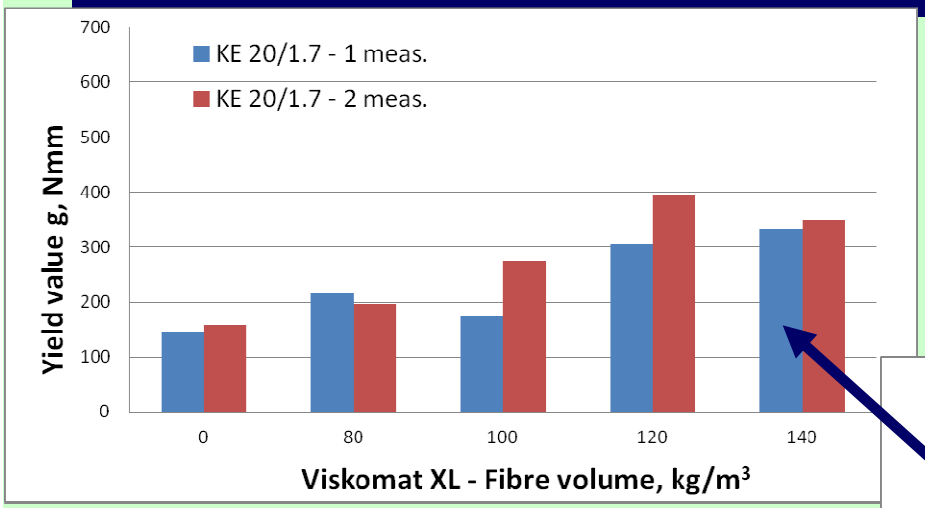
KE 20/1.7 - Yield value g, Nmm

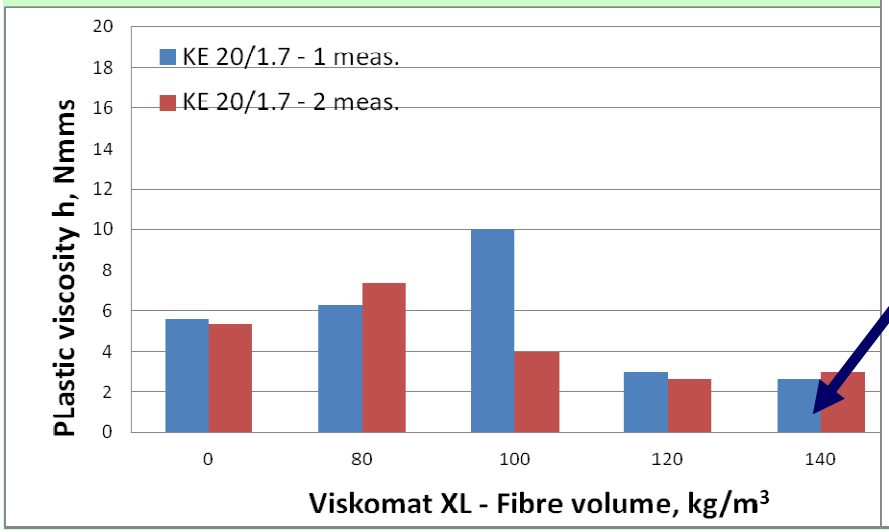


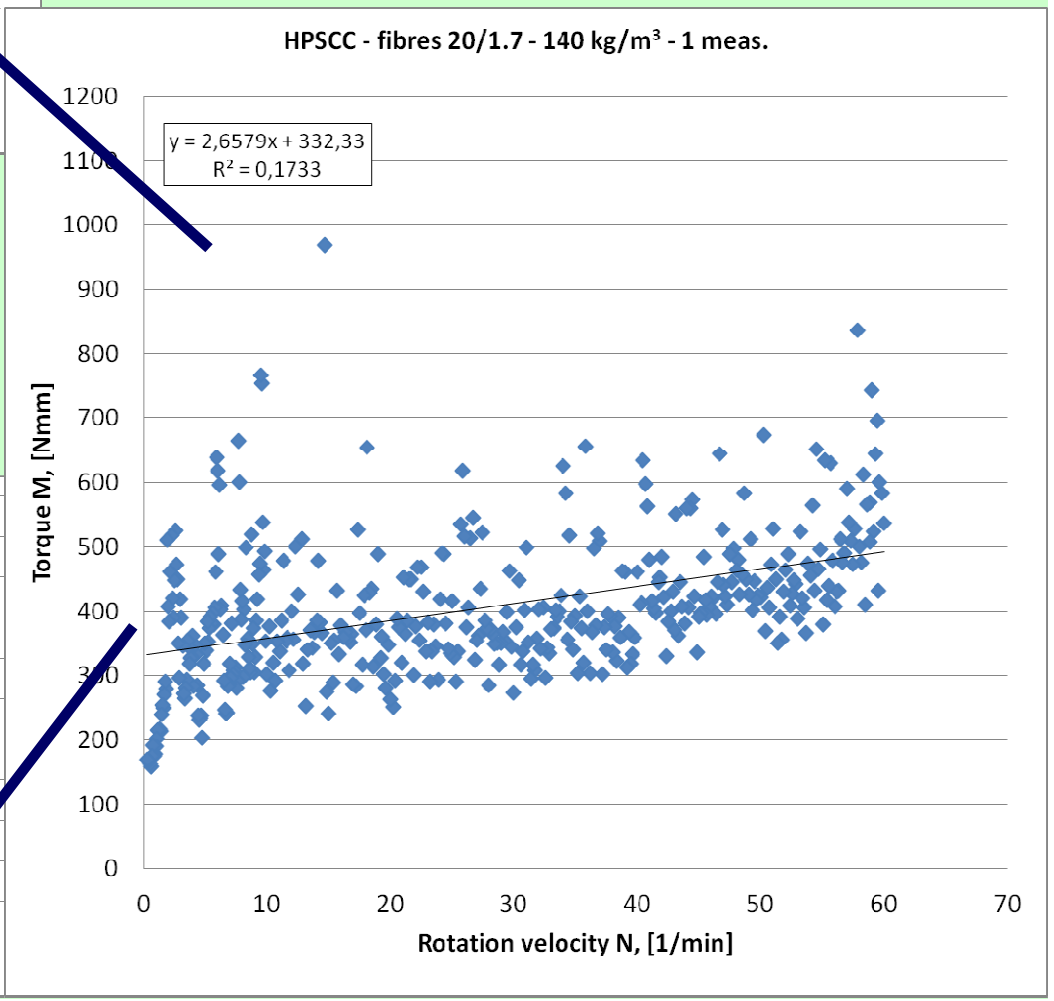




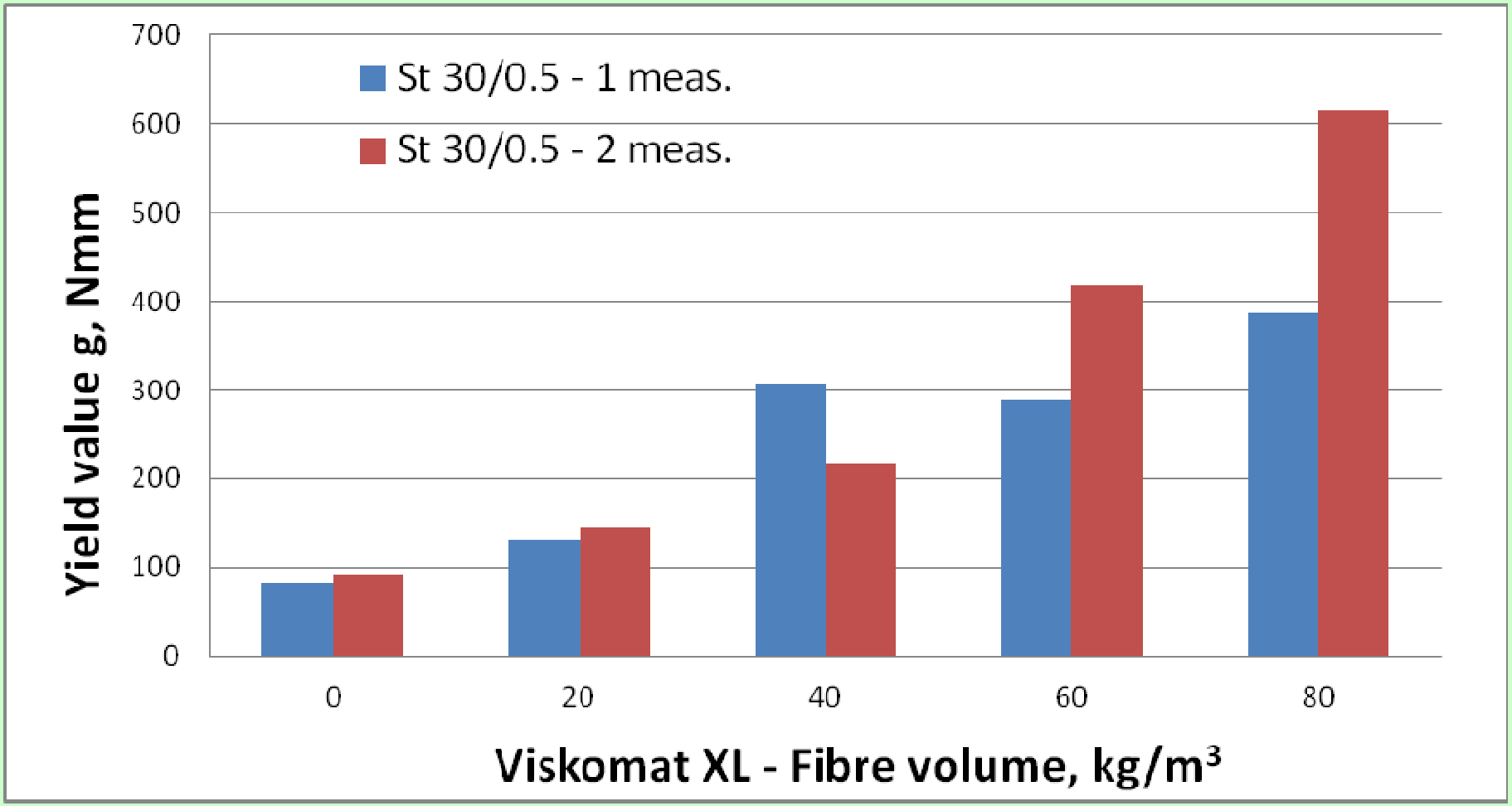
KE 20/1.7 - Yield value g, Nmm



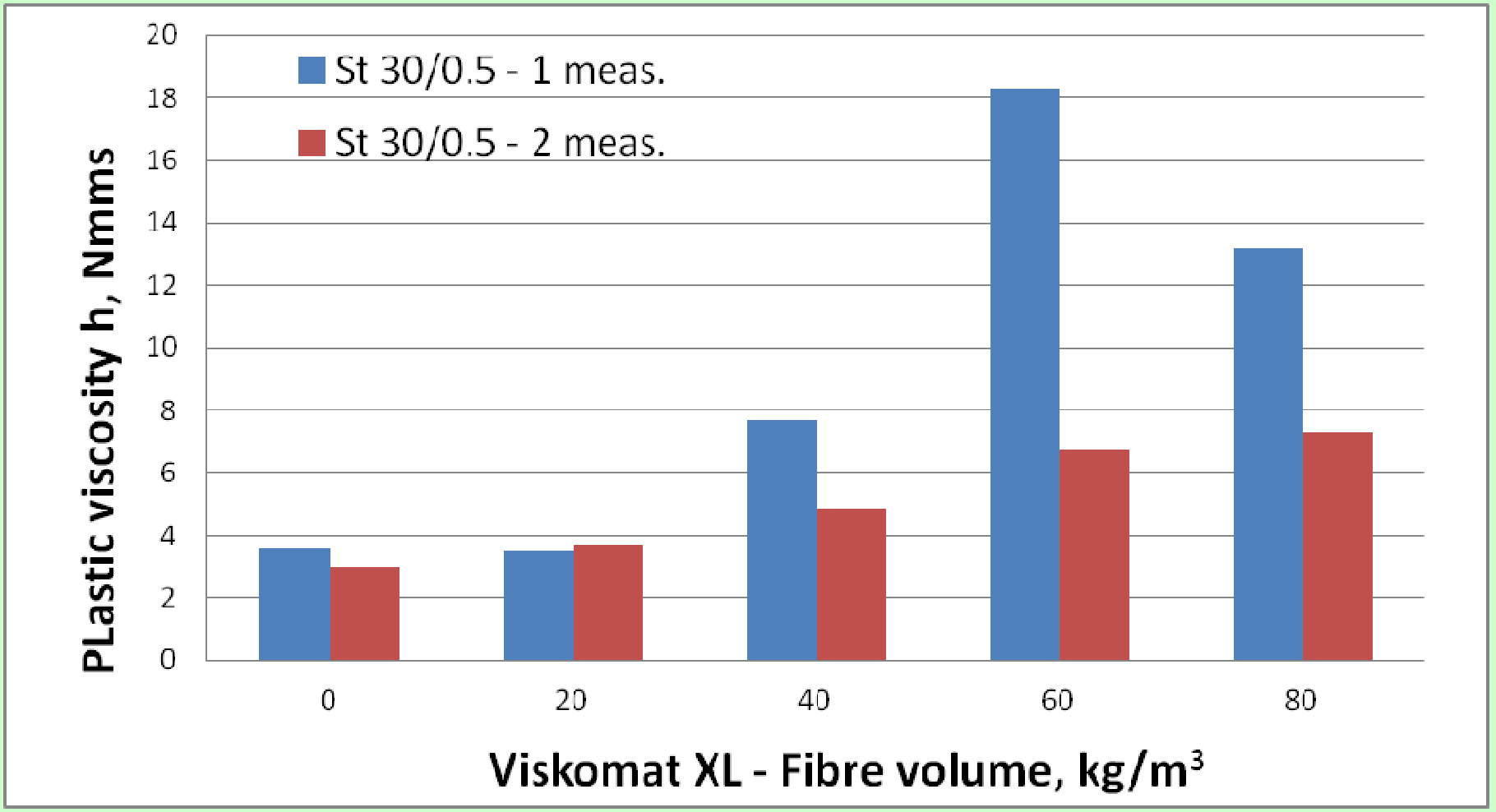




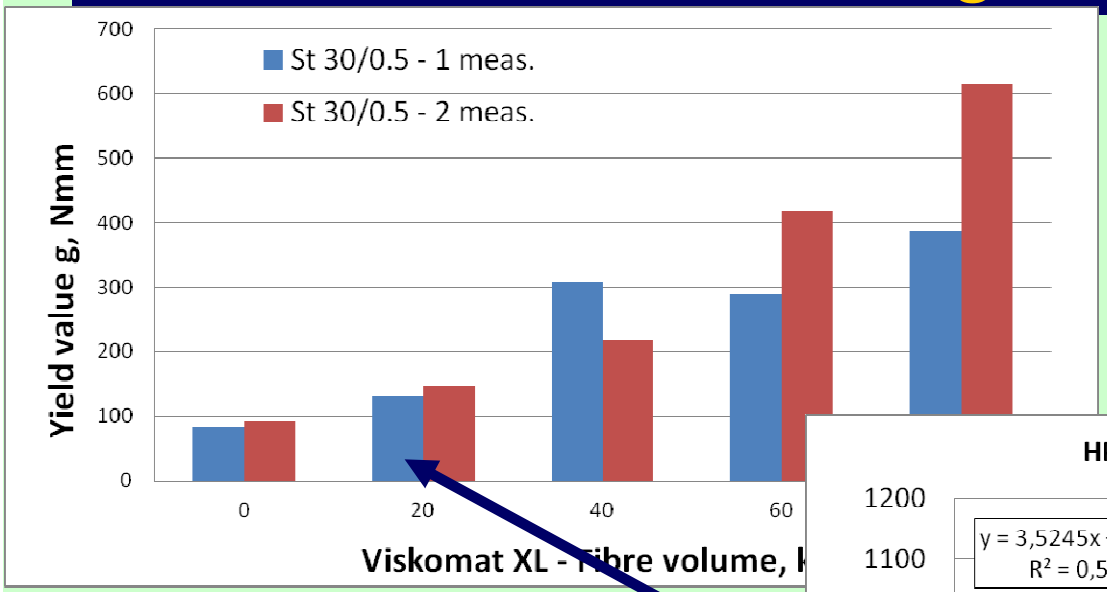
ST 30/0.5 - Yield value g, Nmm

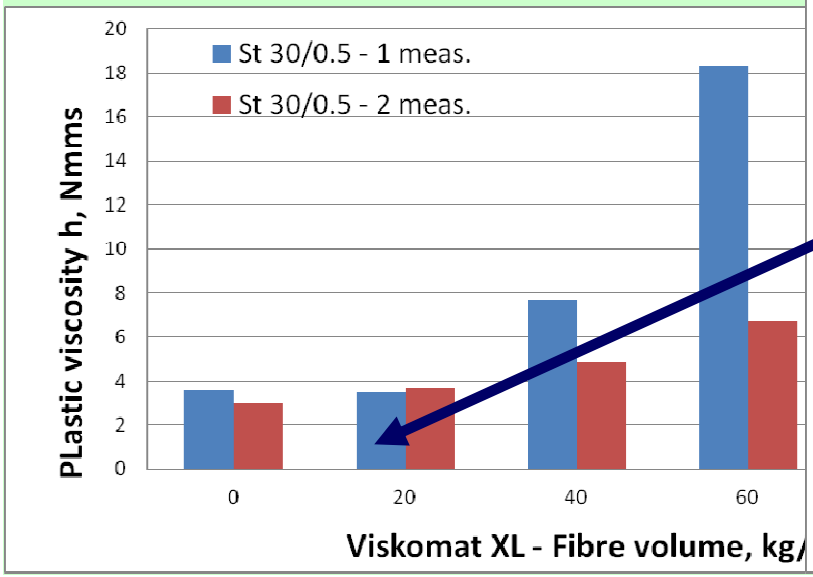


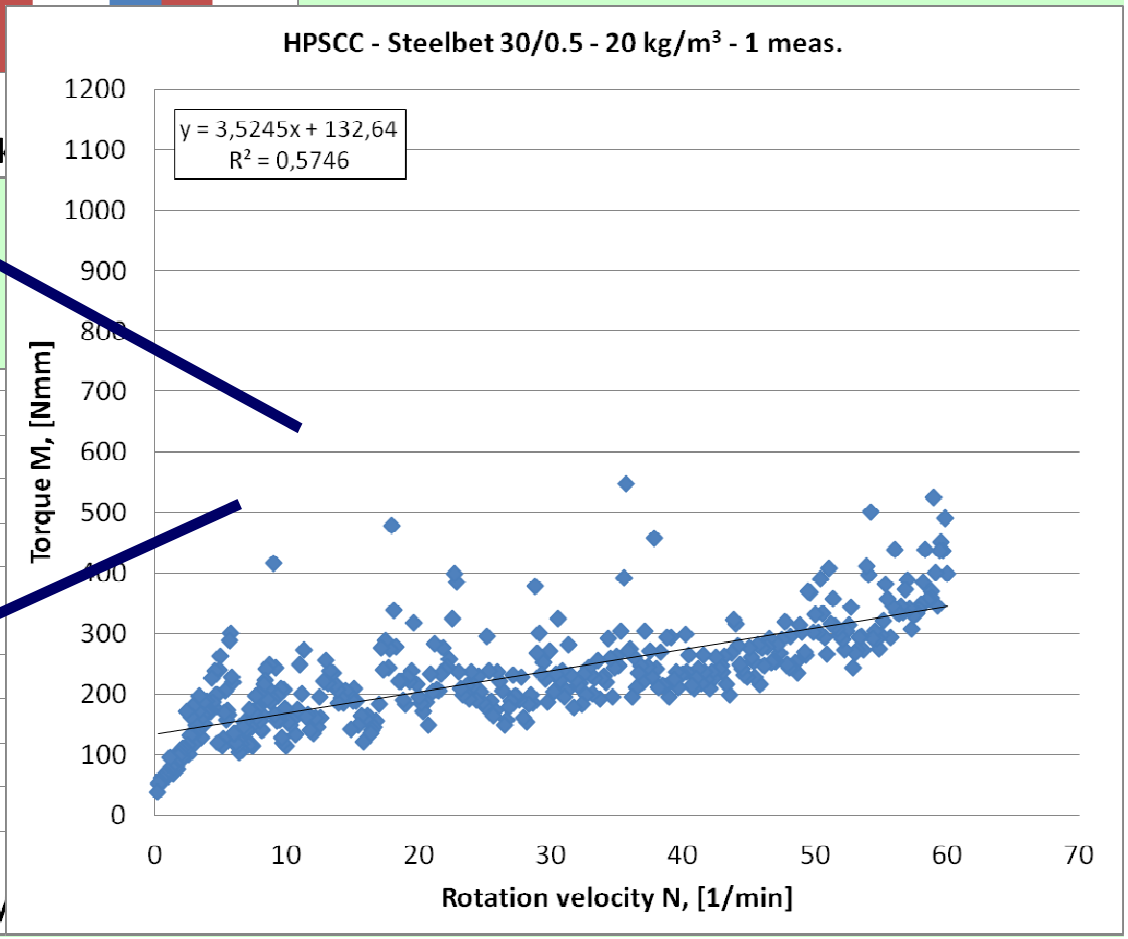
ST 30/0.5 - Plastic viscosity h, Nmms



ST 30/0.5 - g & h values







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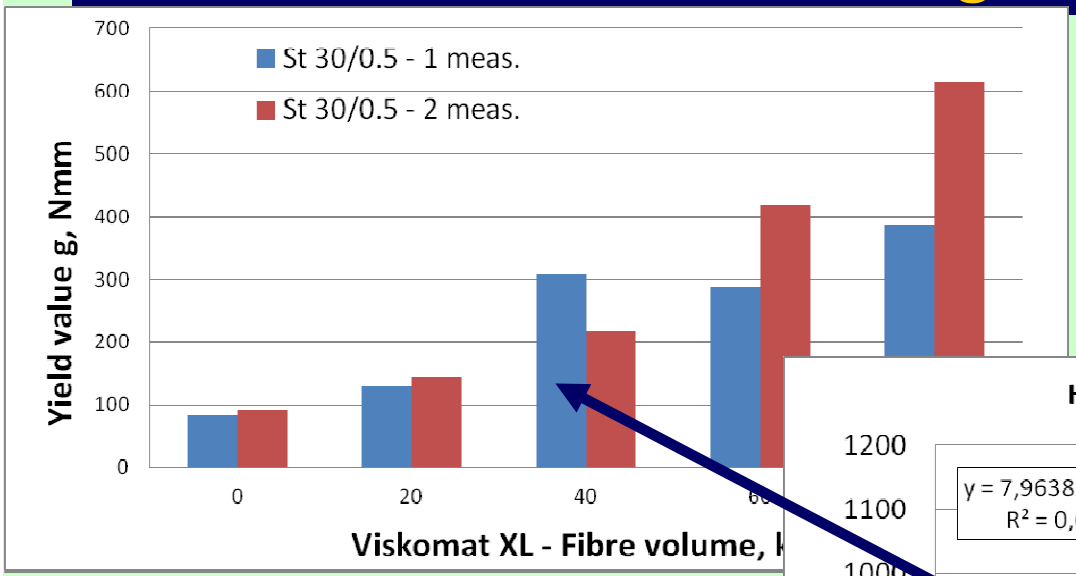

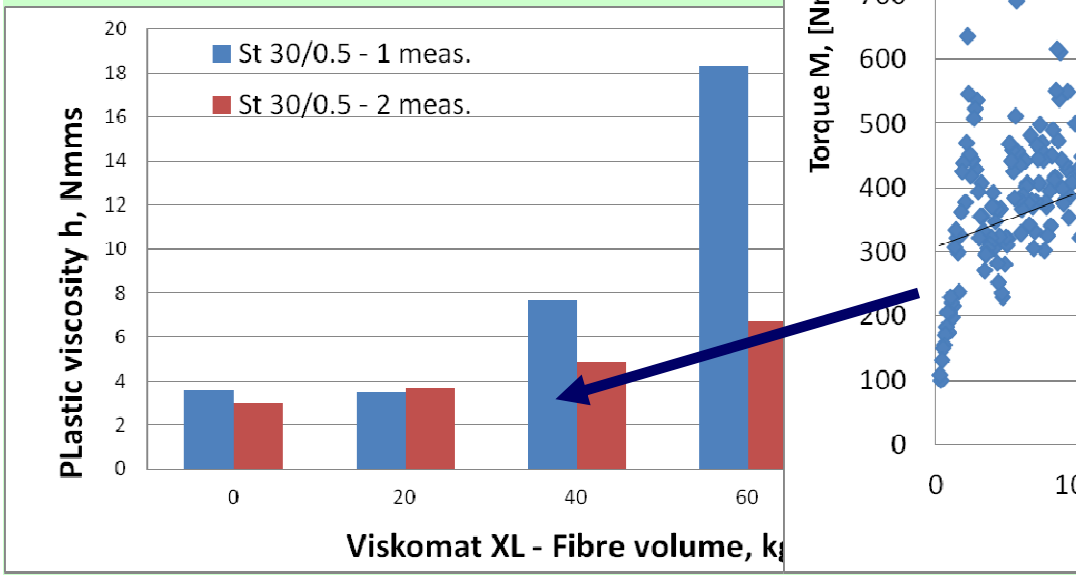

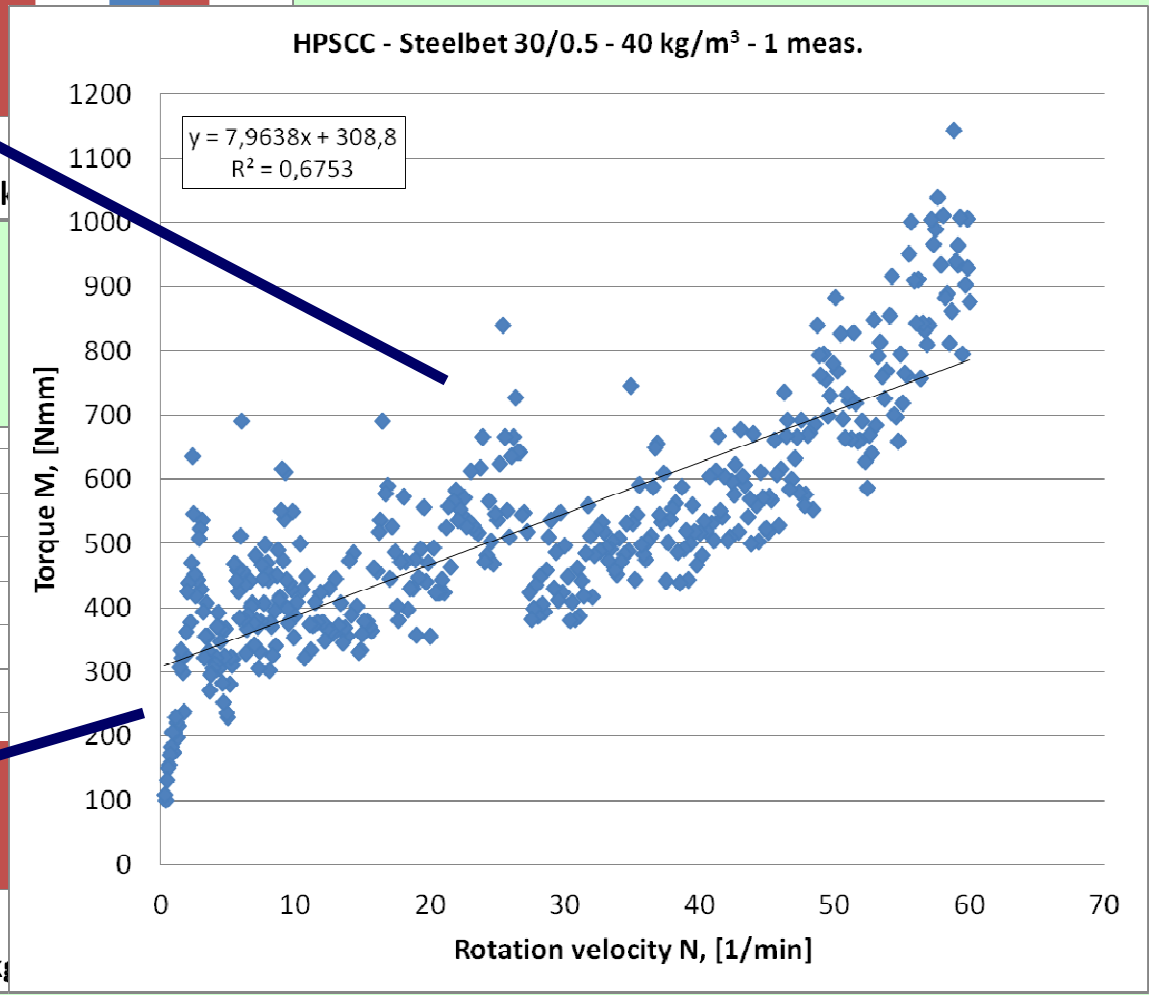

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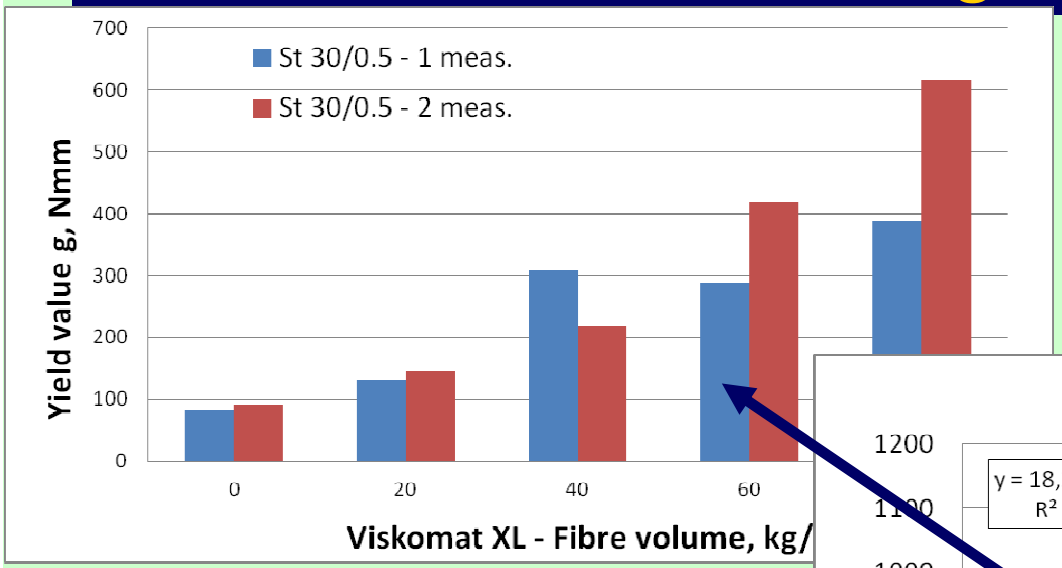
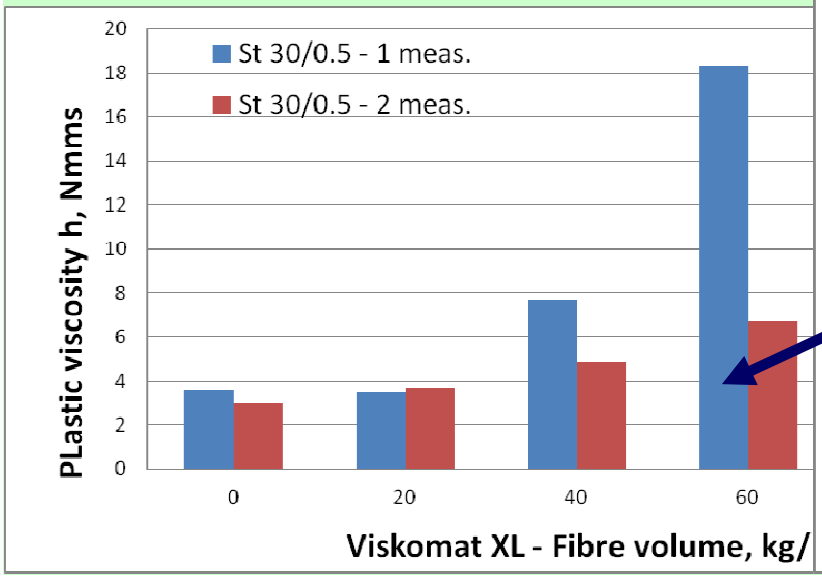
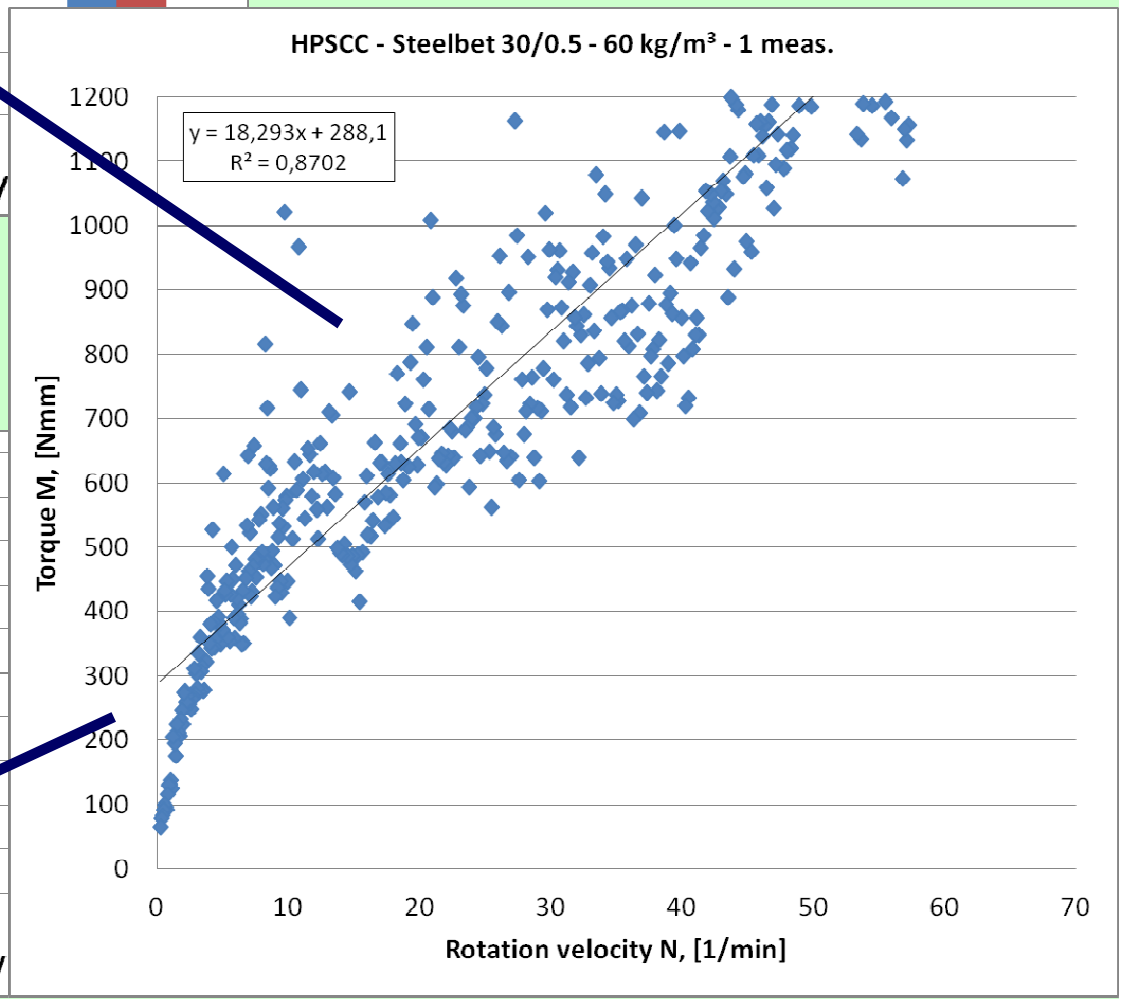
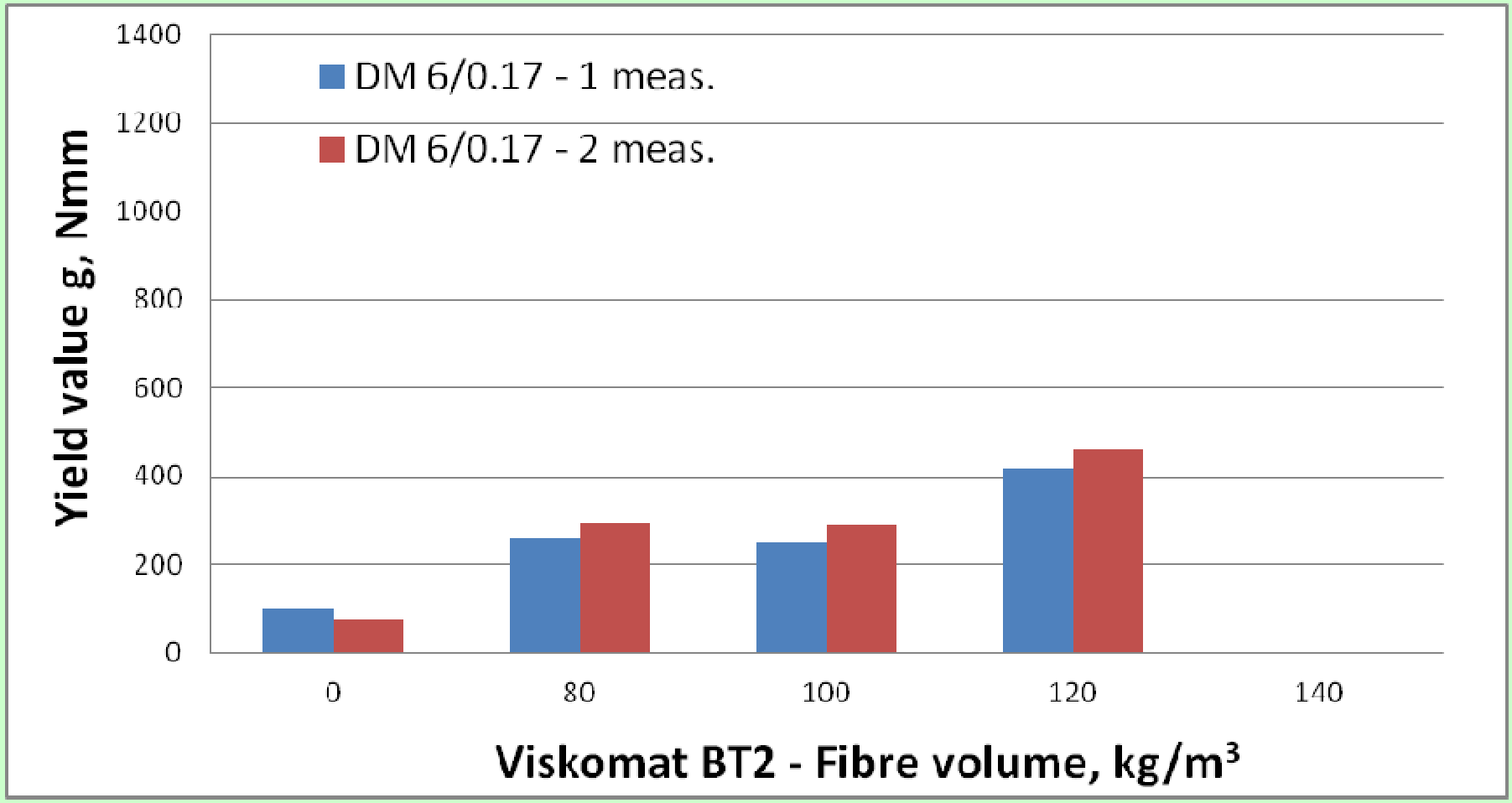
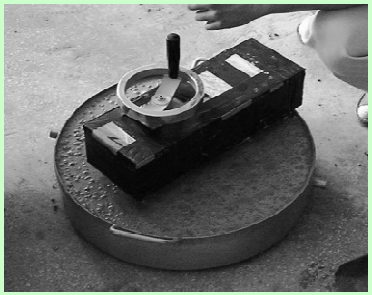




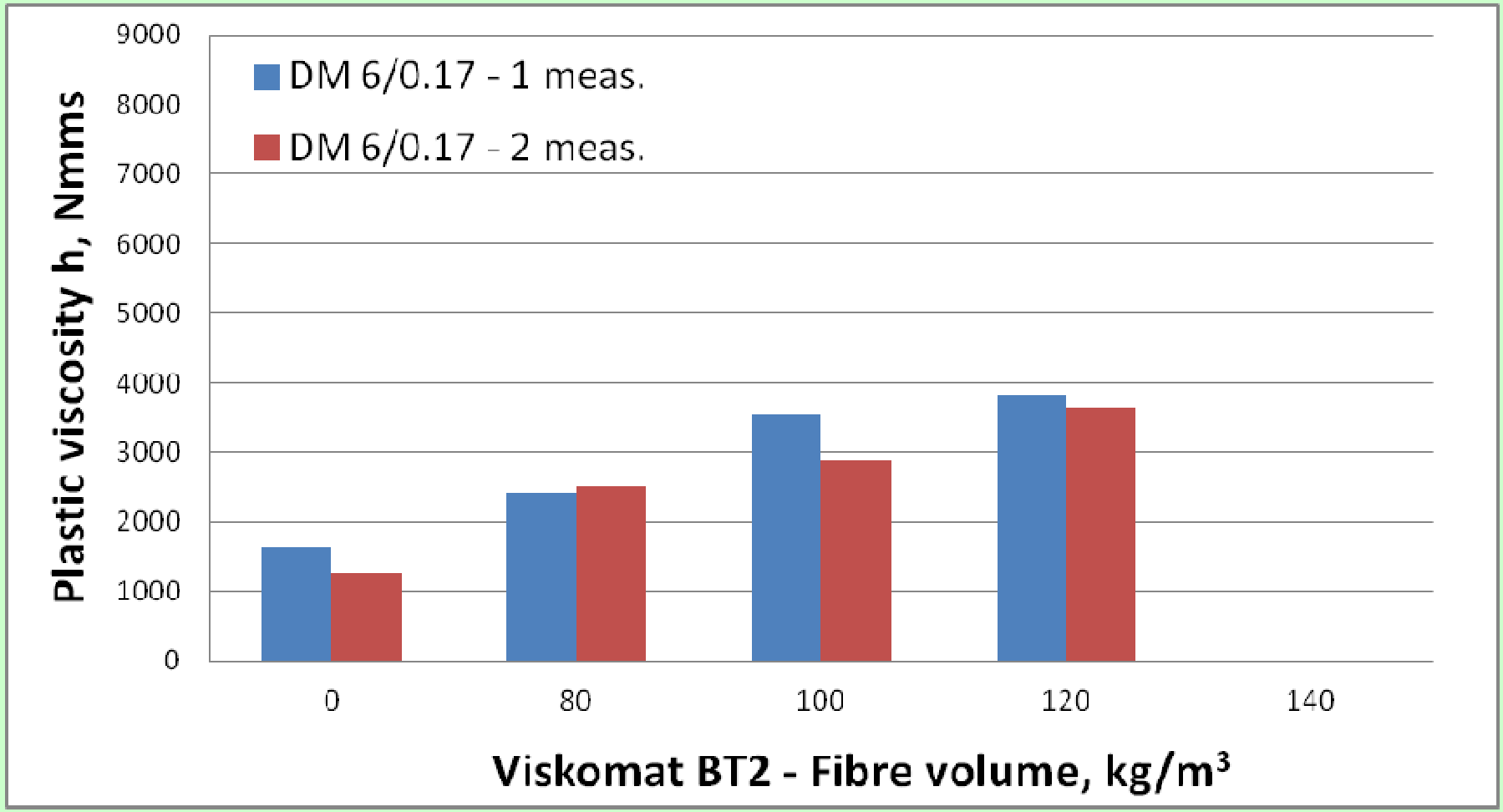


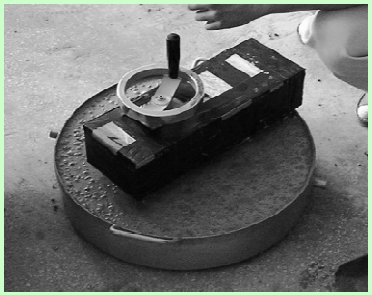
DM 6/0.17 - Yield value g, Nmm



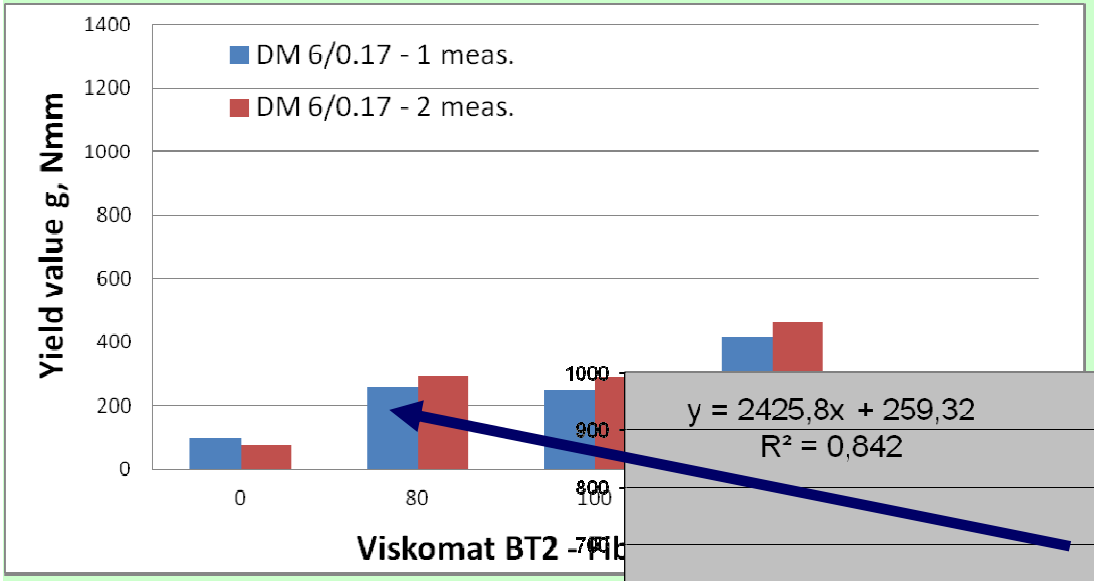


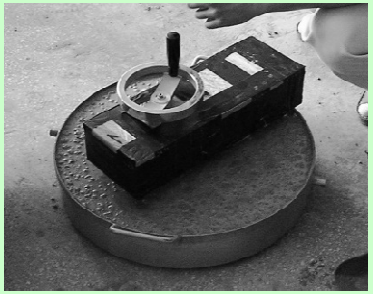
DM 6/0.17 - Plastic viscosity h, Nmms

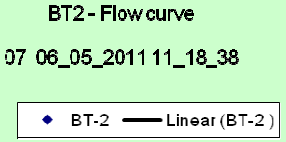


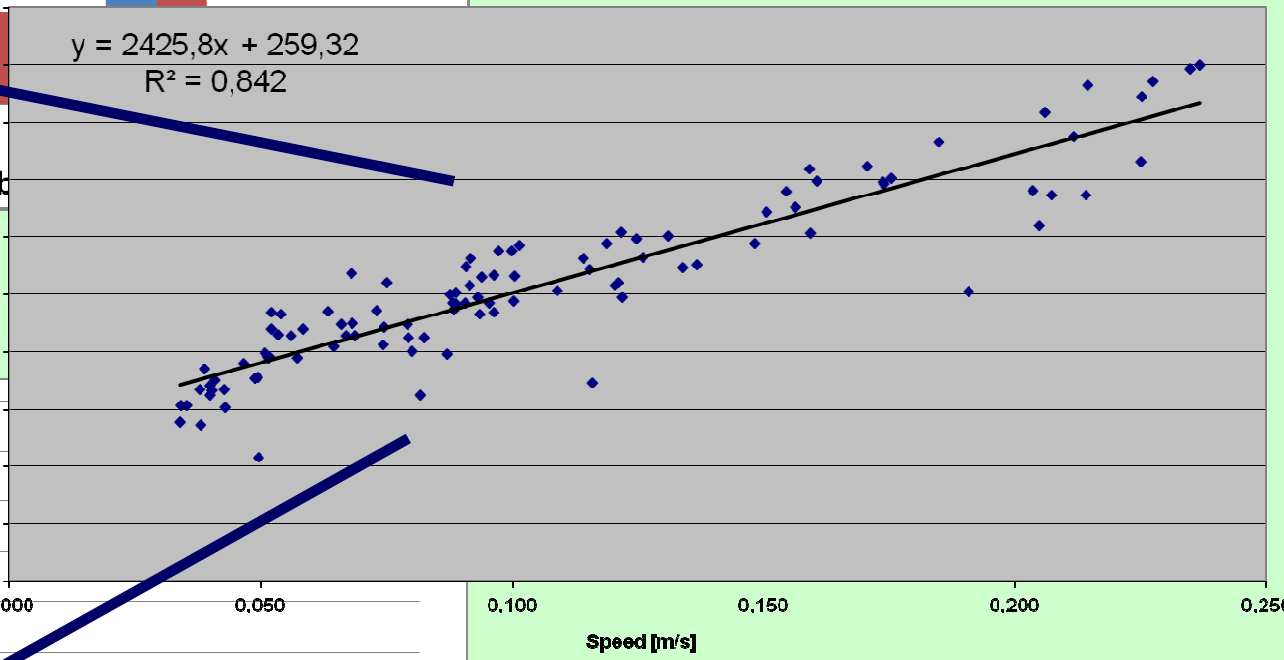


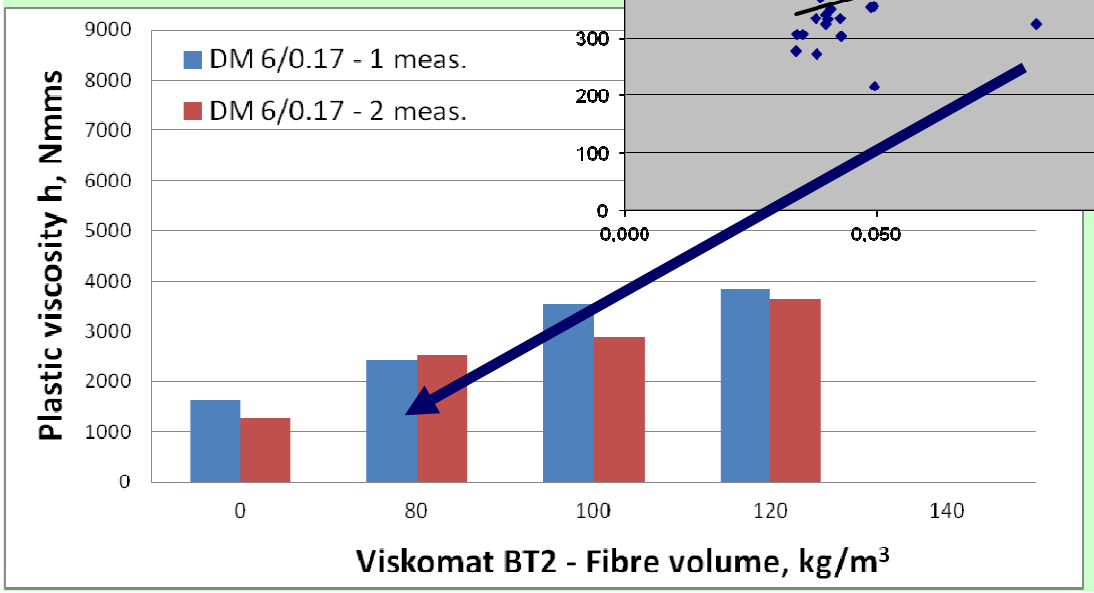
DM 6/0.17 – g & h values



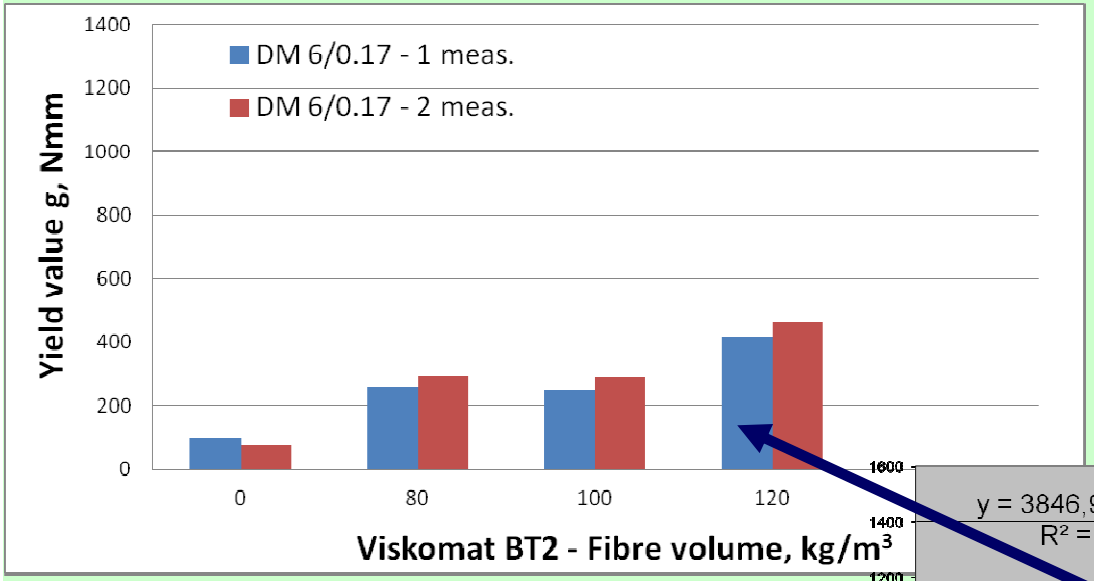


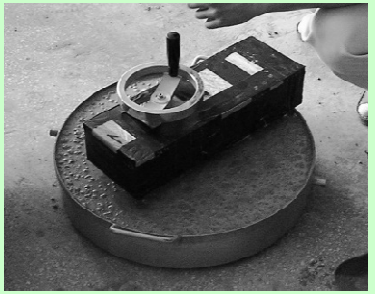


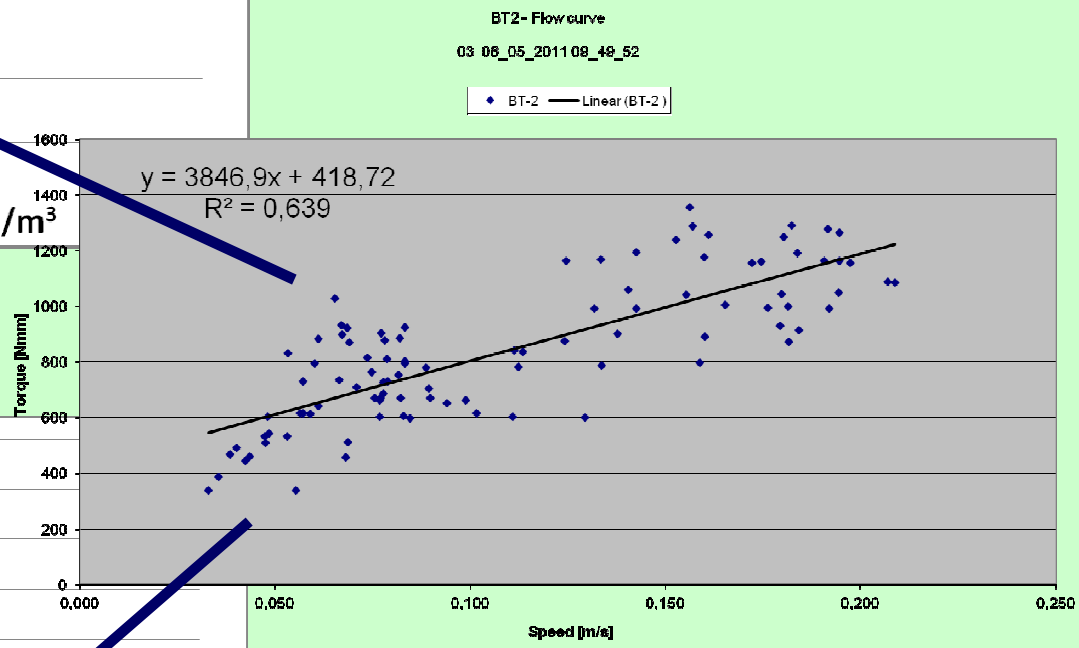


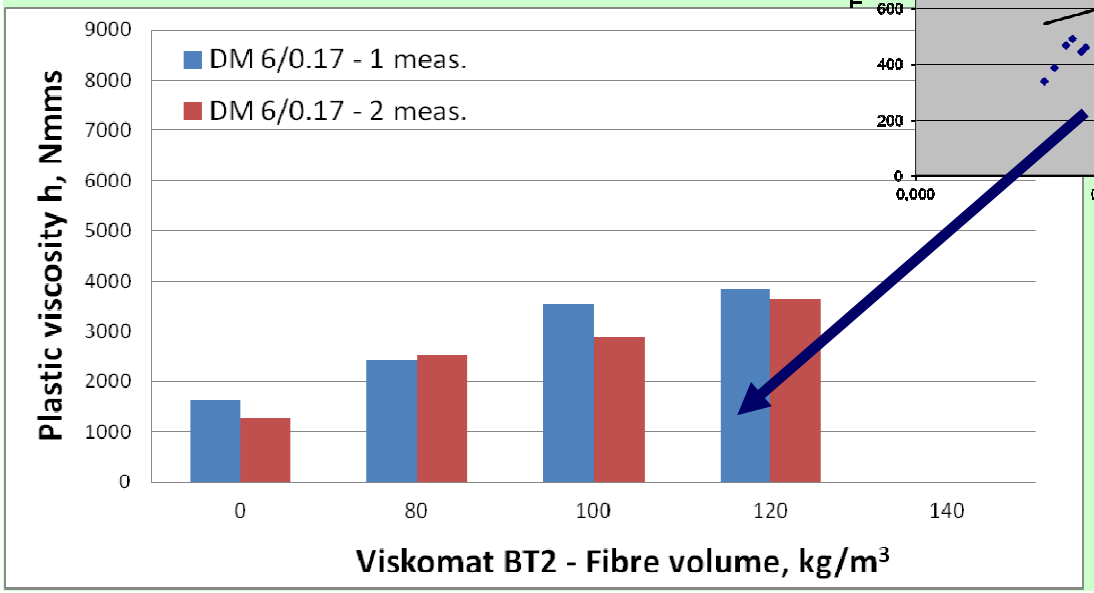


DM 6/0.17 - g & h values

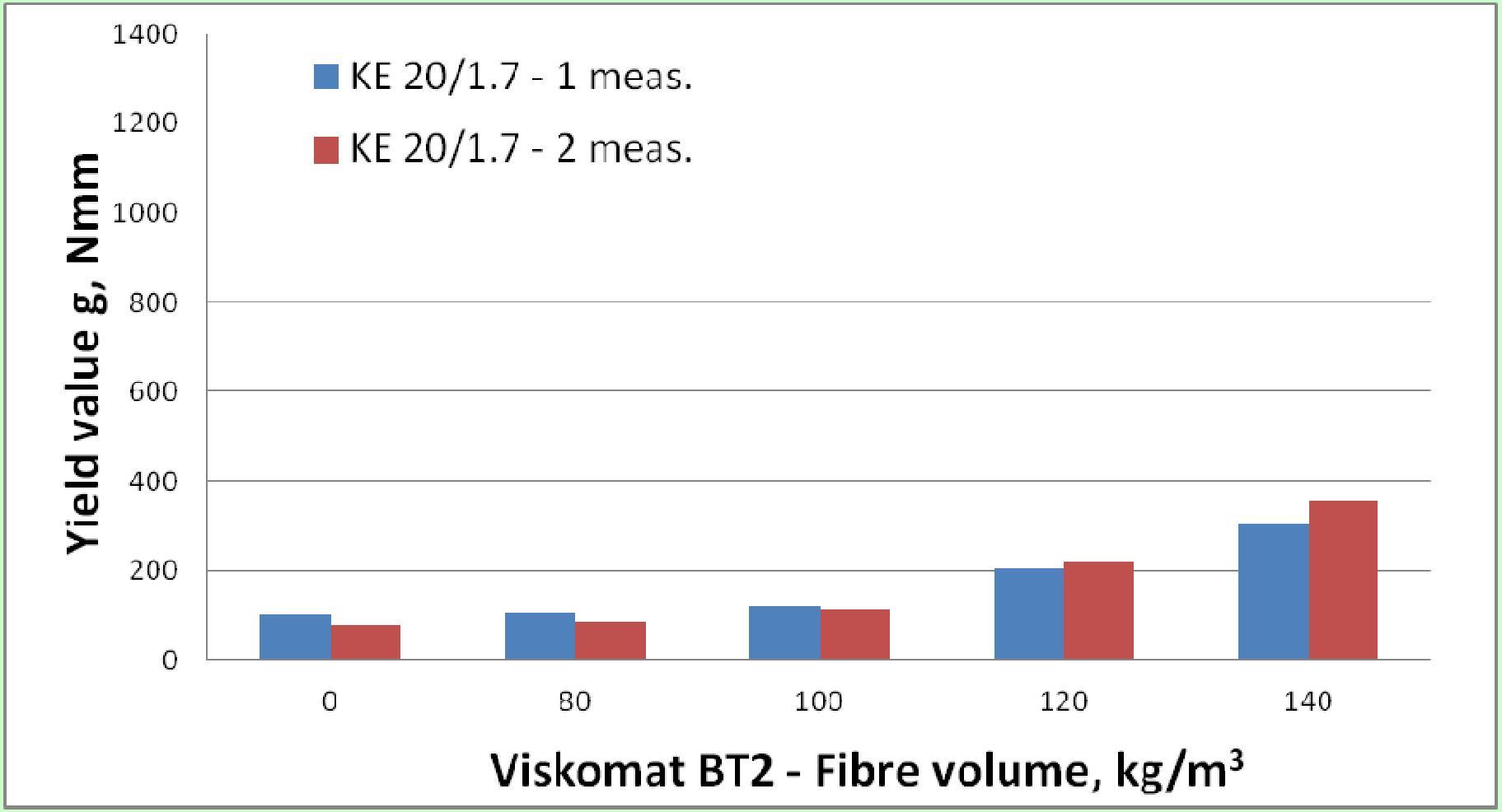


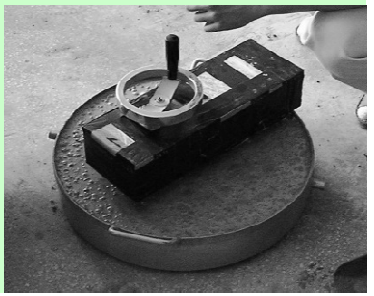




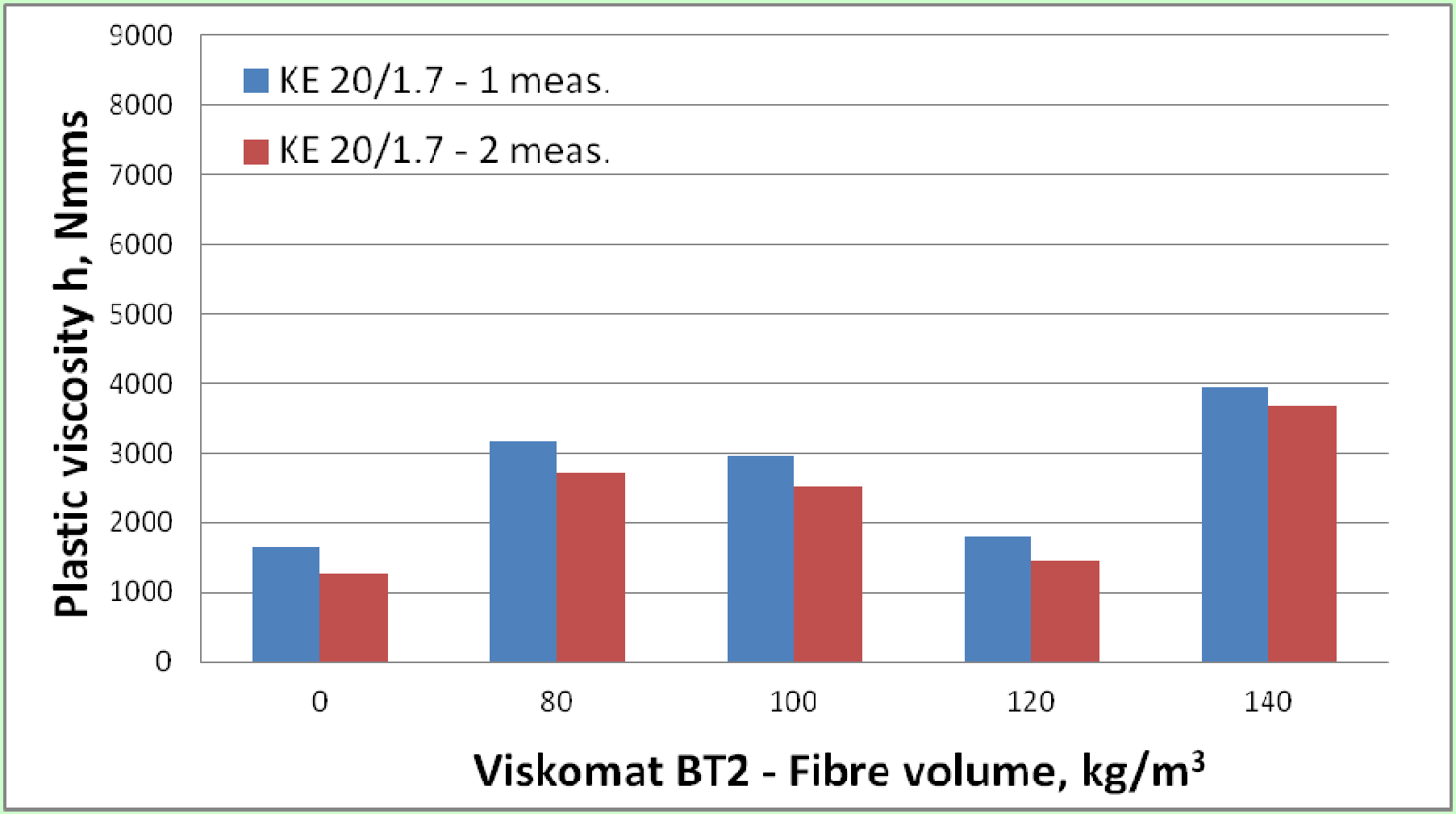


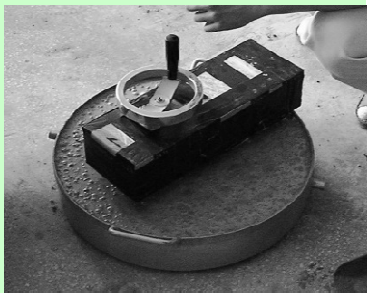
KE 20/1.7 - Yield value g, Nmm



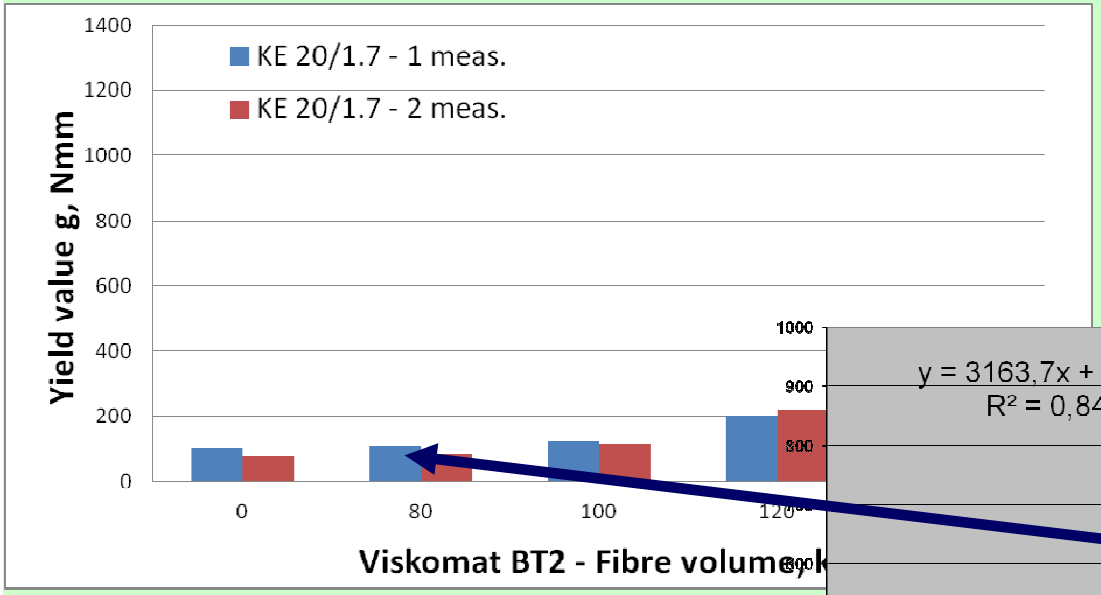


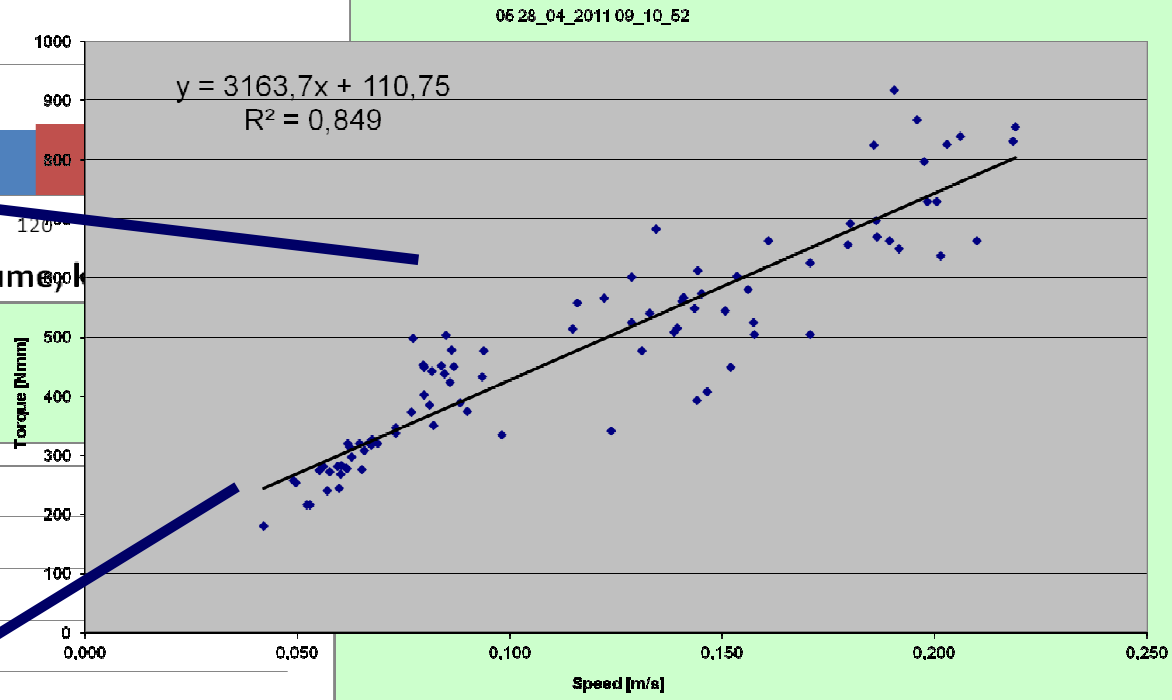
KE 20/1.7 - Plastic viscosity h, Nmms

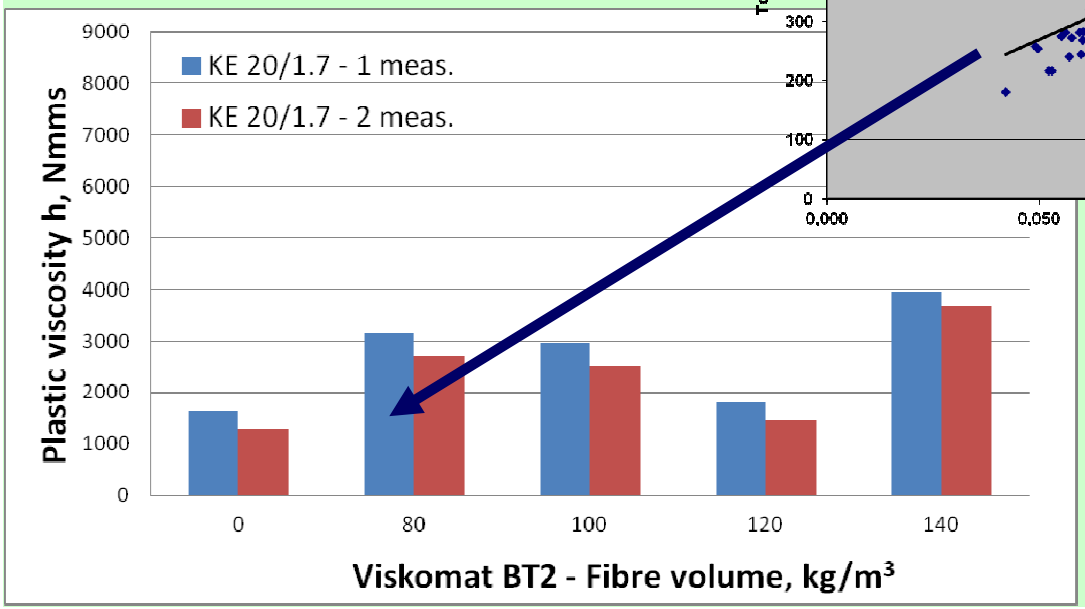


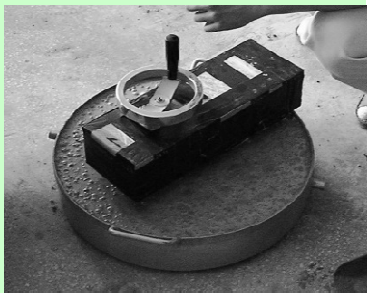


KE 20/1.7 - g & h values

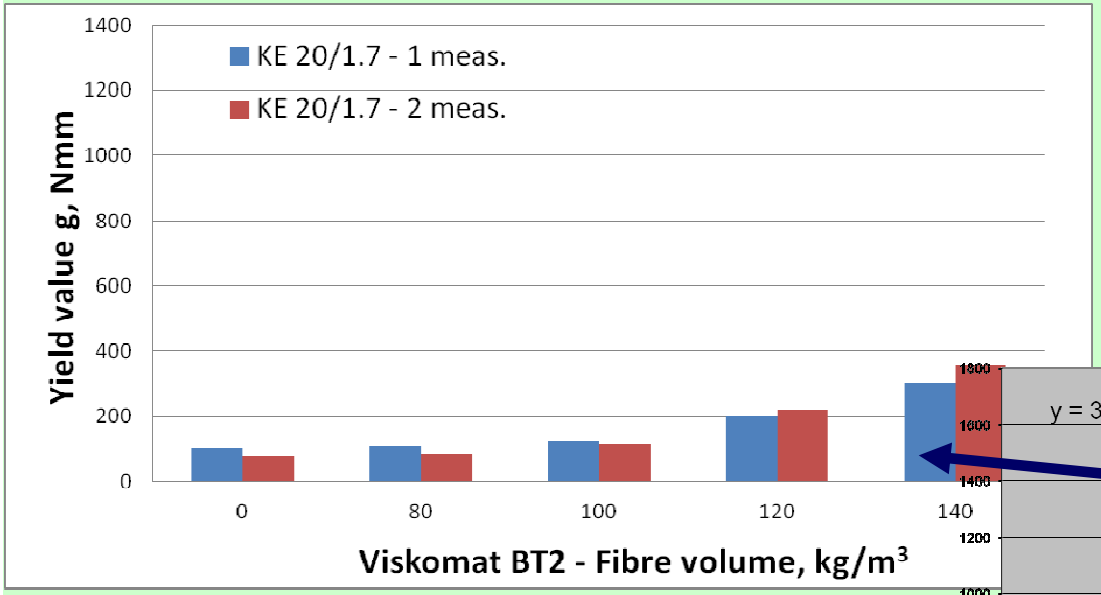


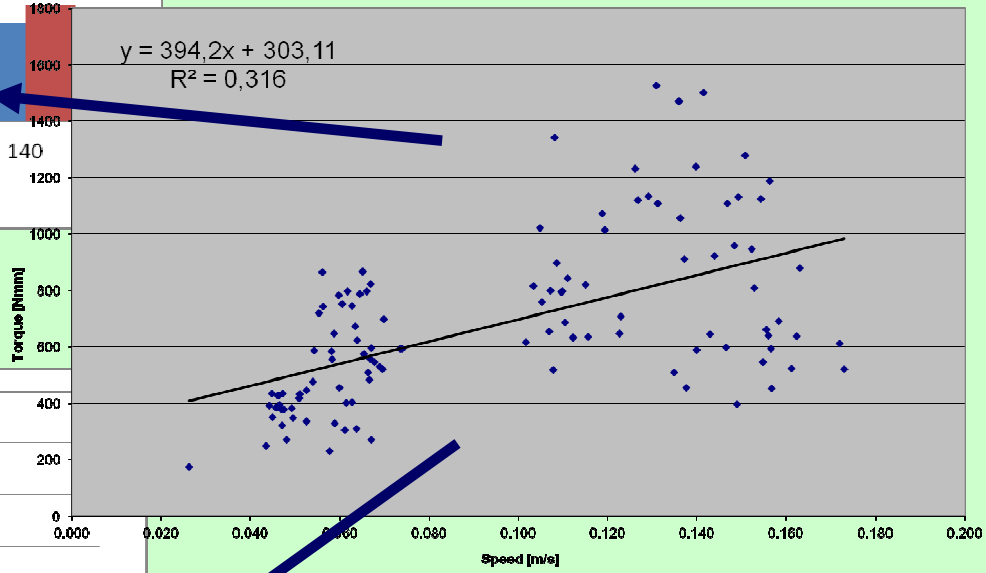


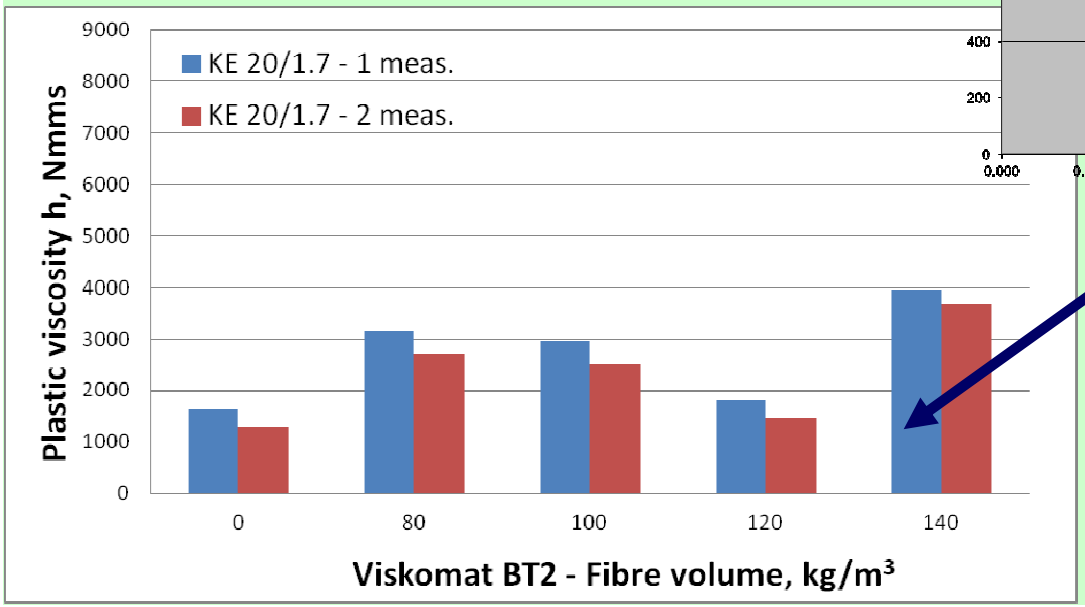


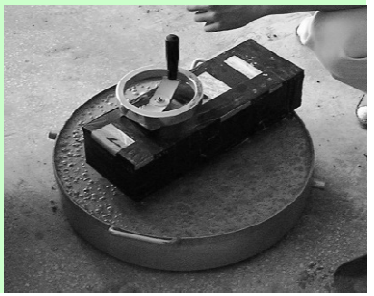


KE 20/1.7 - g & h values

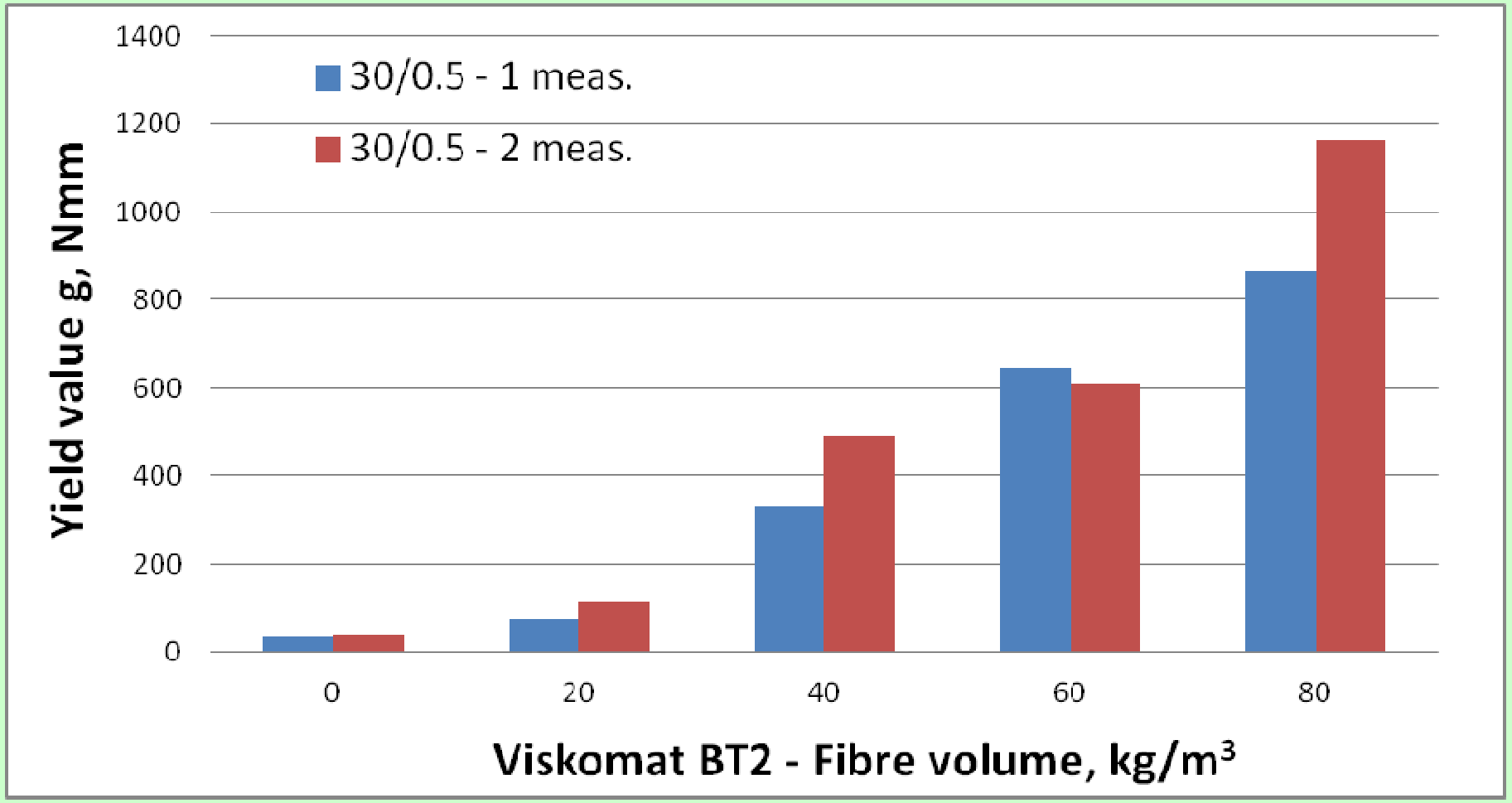


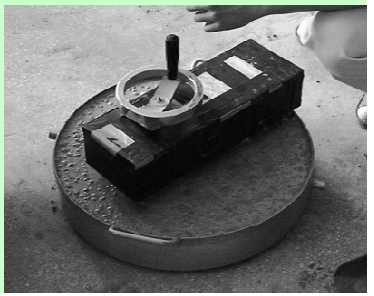




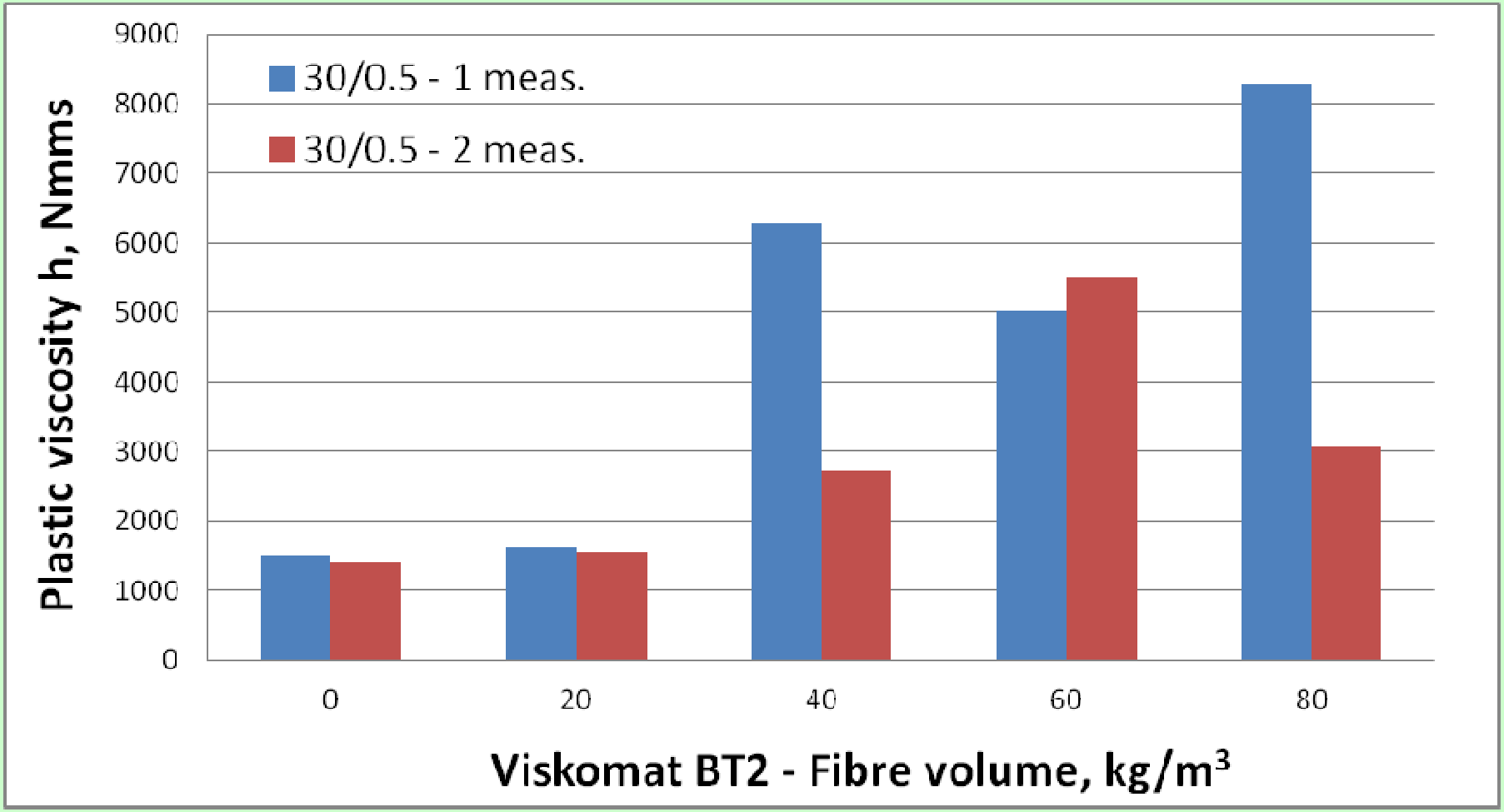


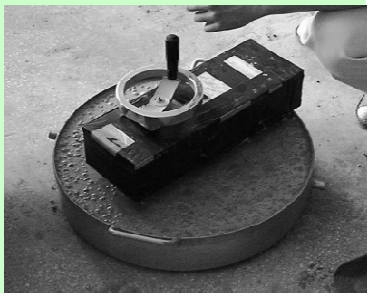
ST 30/0.5 - Yield value g, Nmm



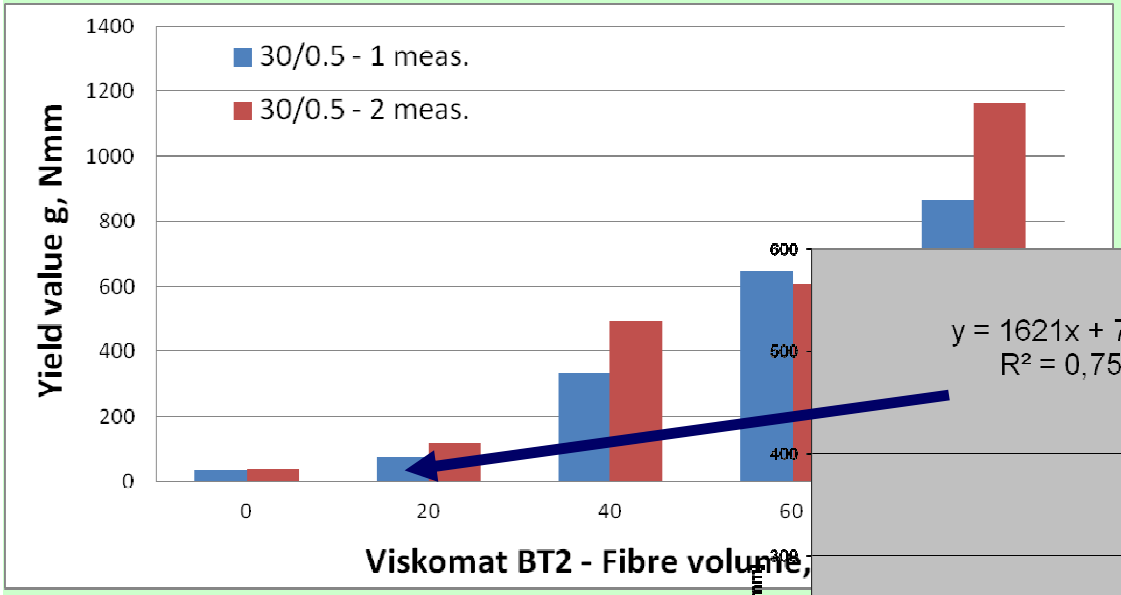


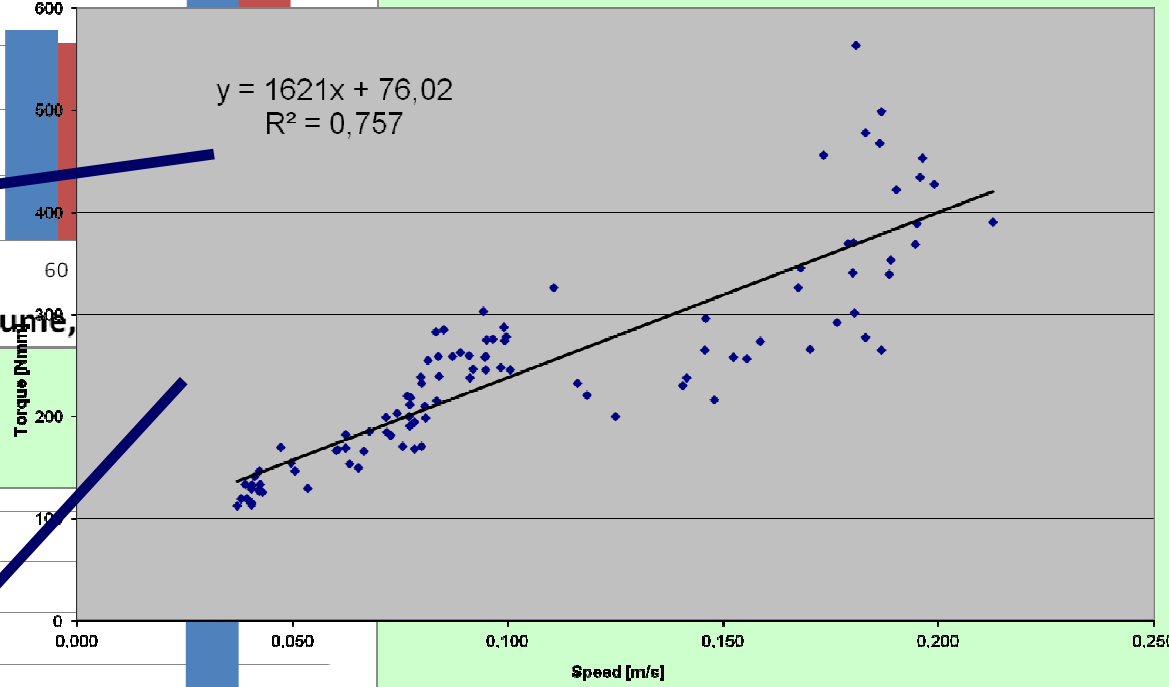
ST 30/0.5 - Plastic viscosity h, Nmms

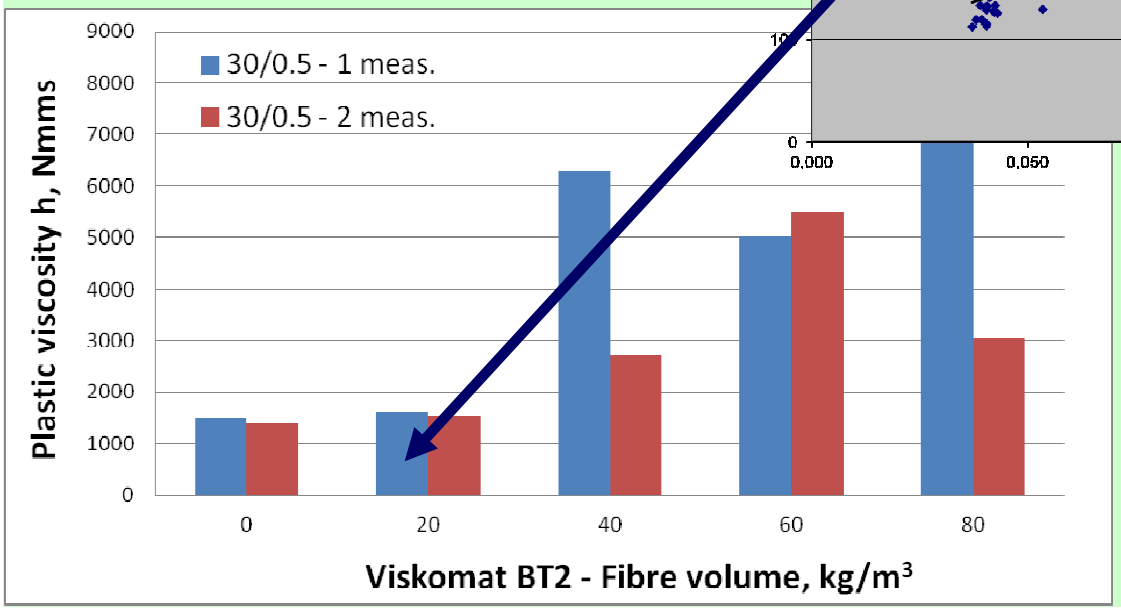


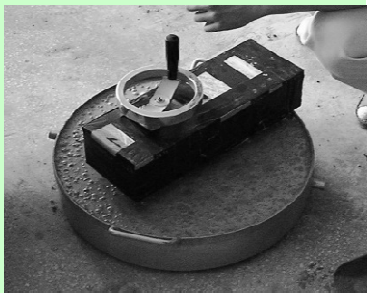


ST 30/0.5 - g & h values

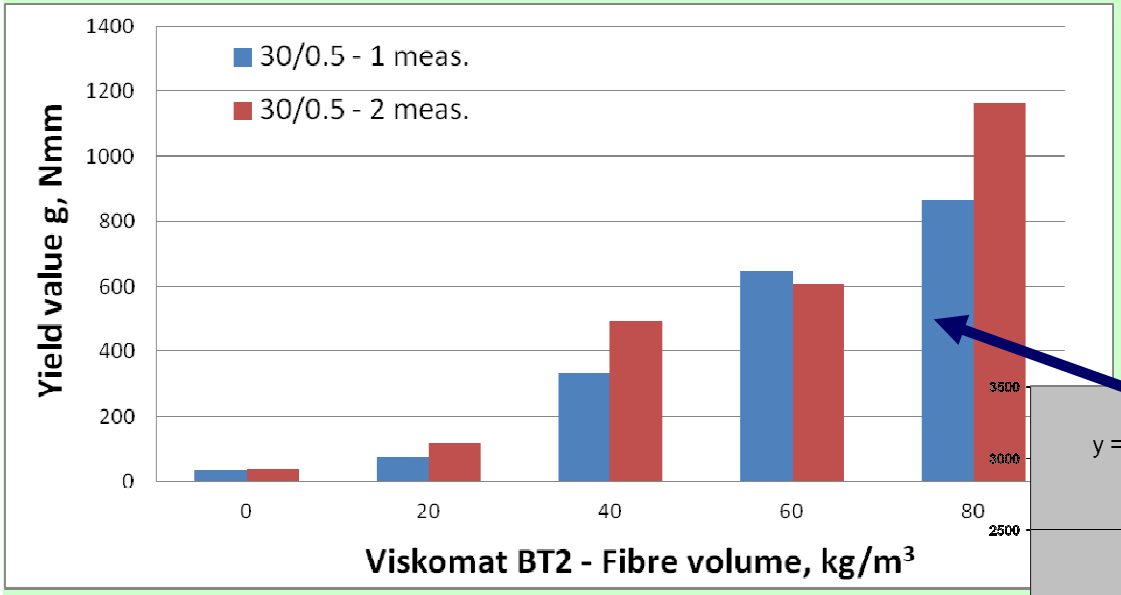


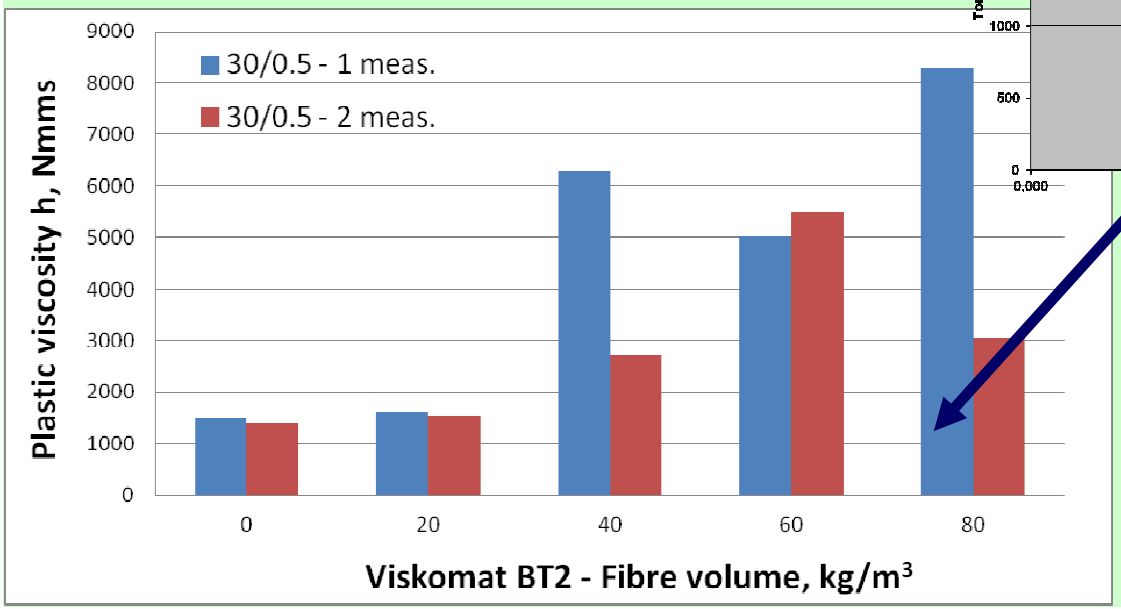


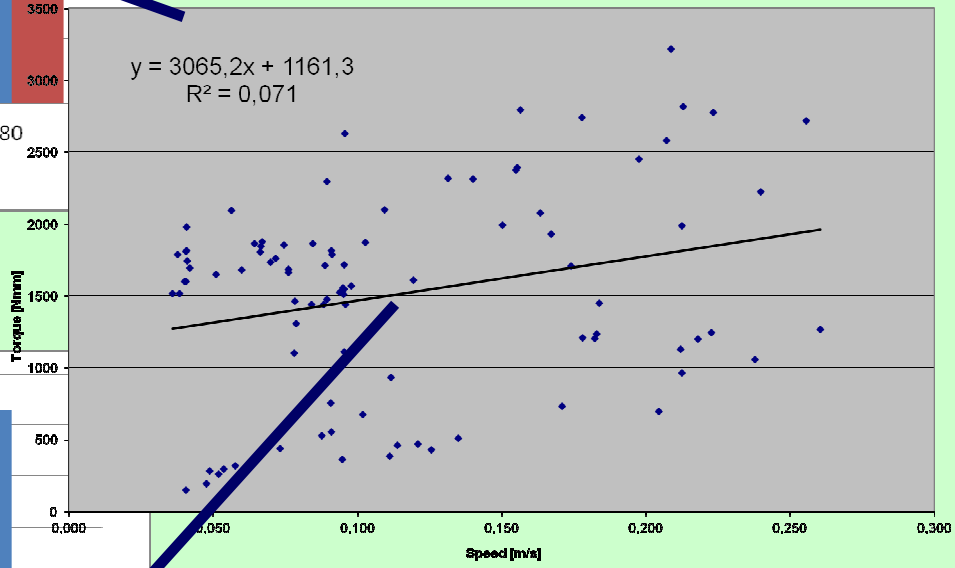


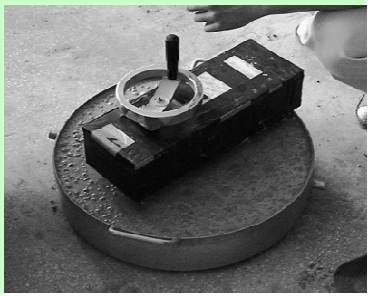


ST 30/0.5 - g & h values

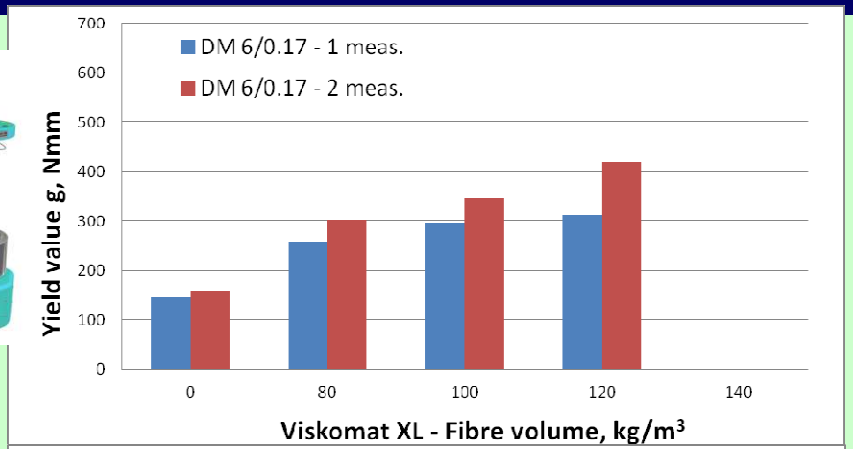


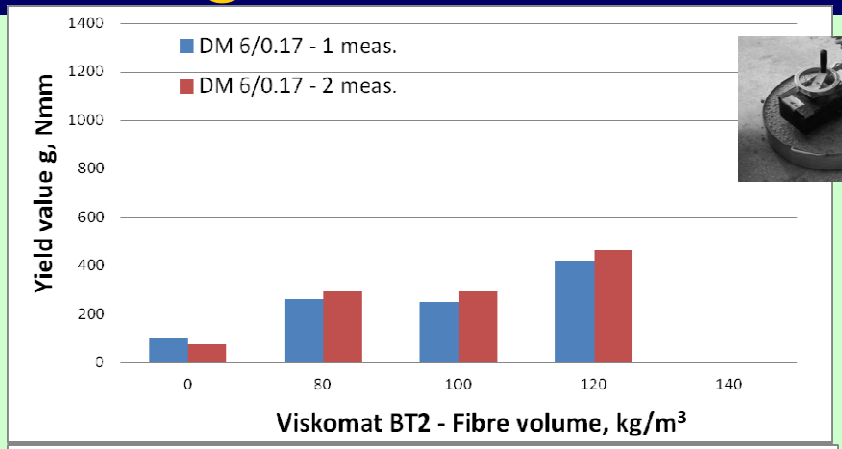


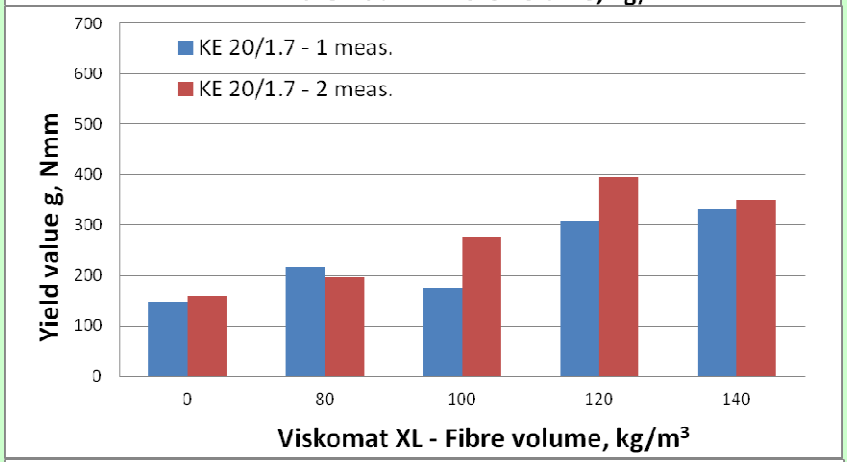


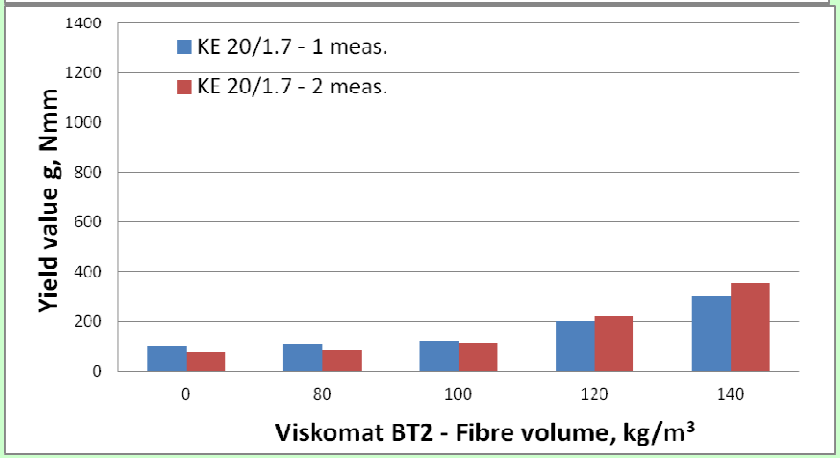


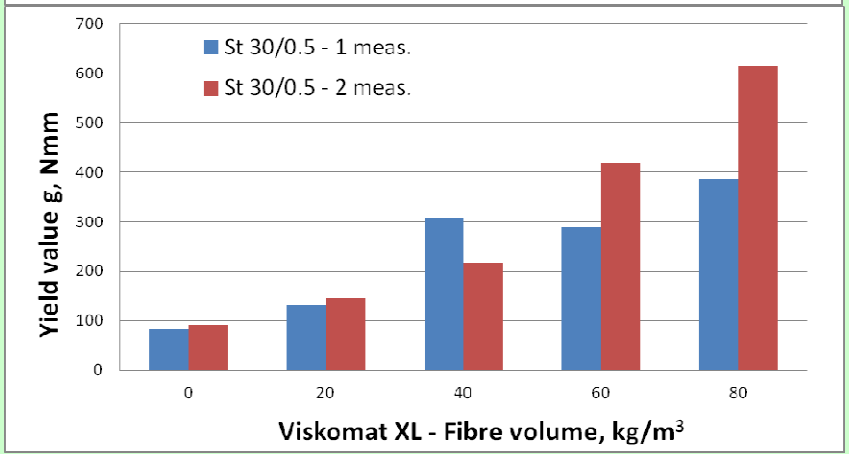
Viskomat XL & BT2 - g values

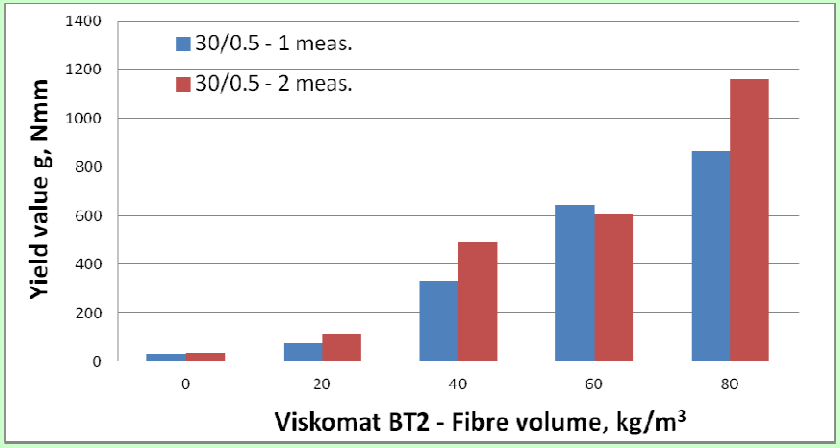




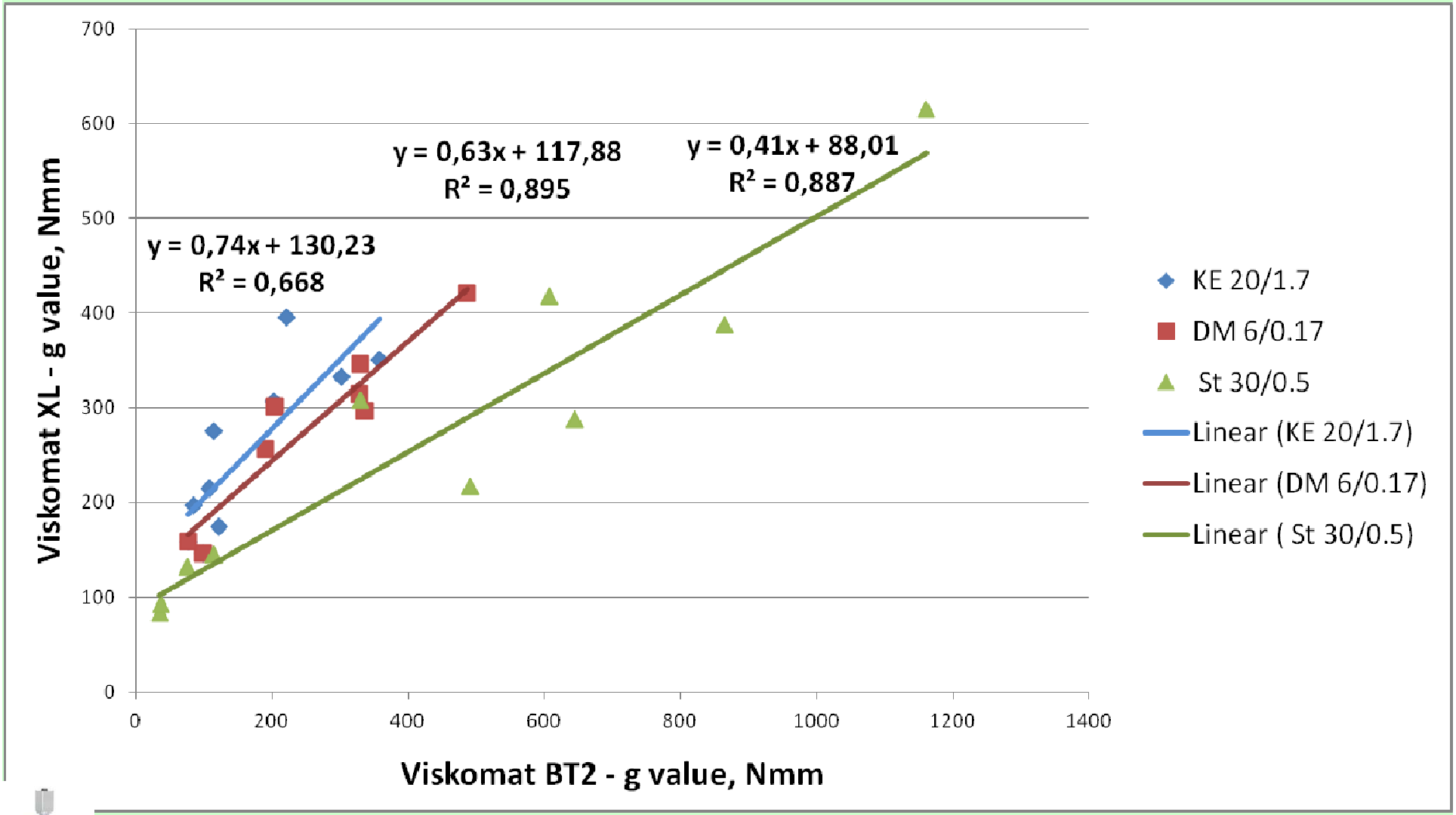


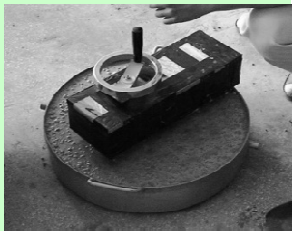




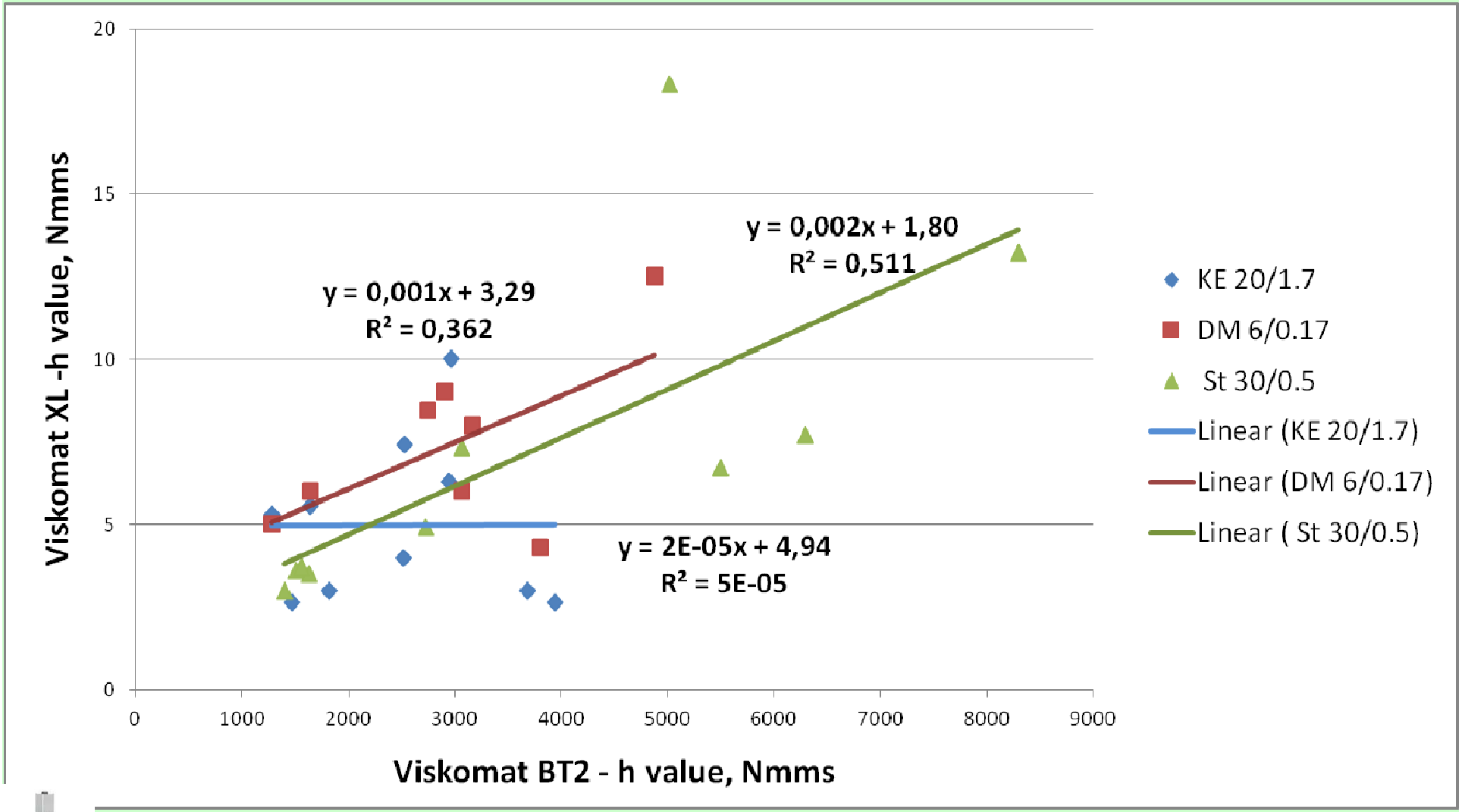


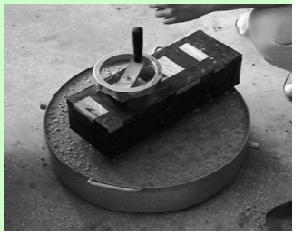
Viskomat XL & BT2 - g value correlation



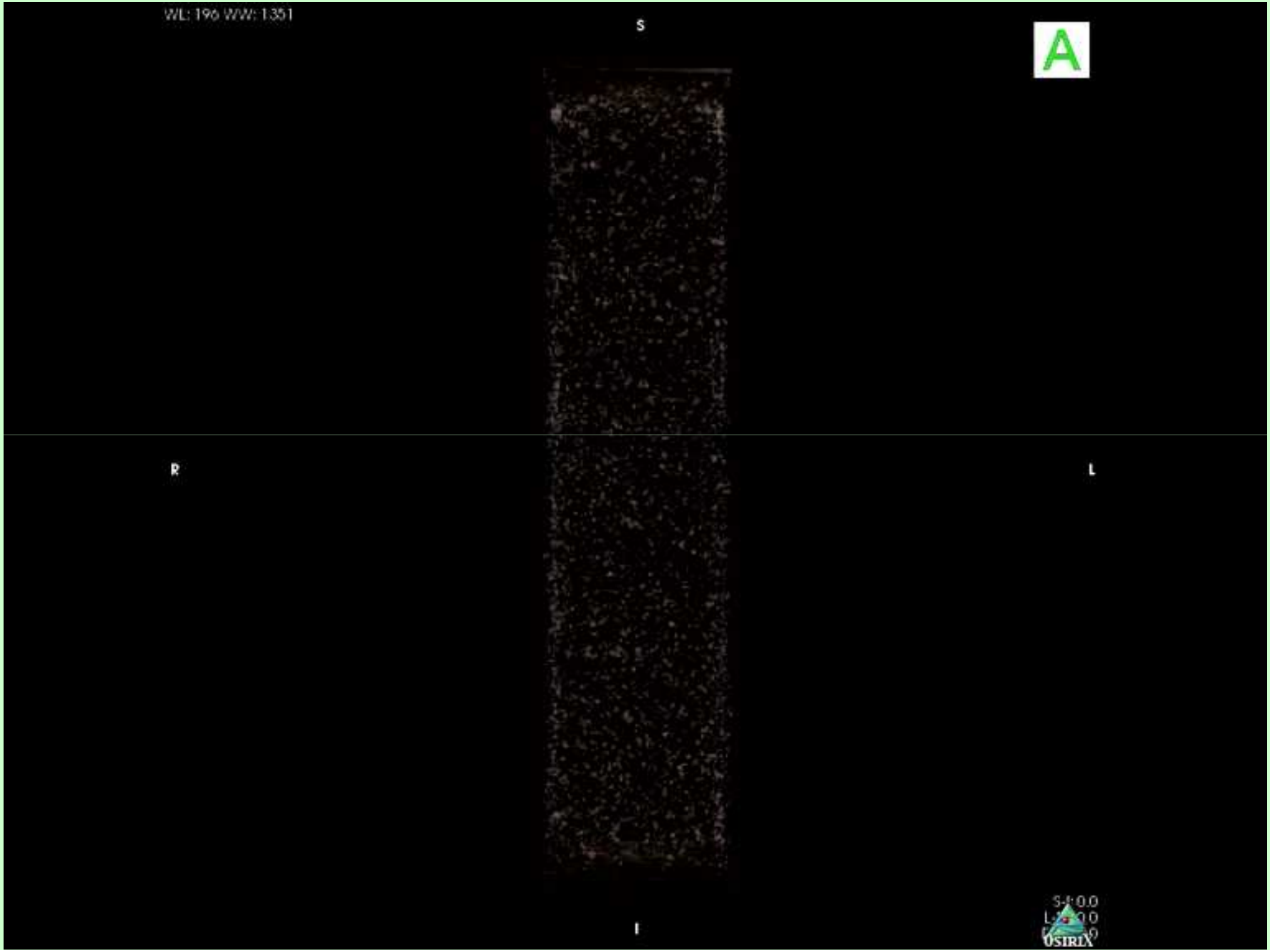


Viskomat XL & BT2 - h value correlation

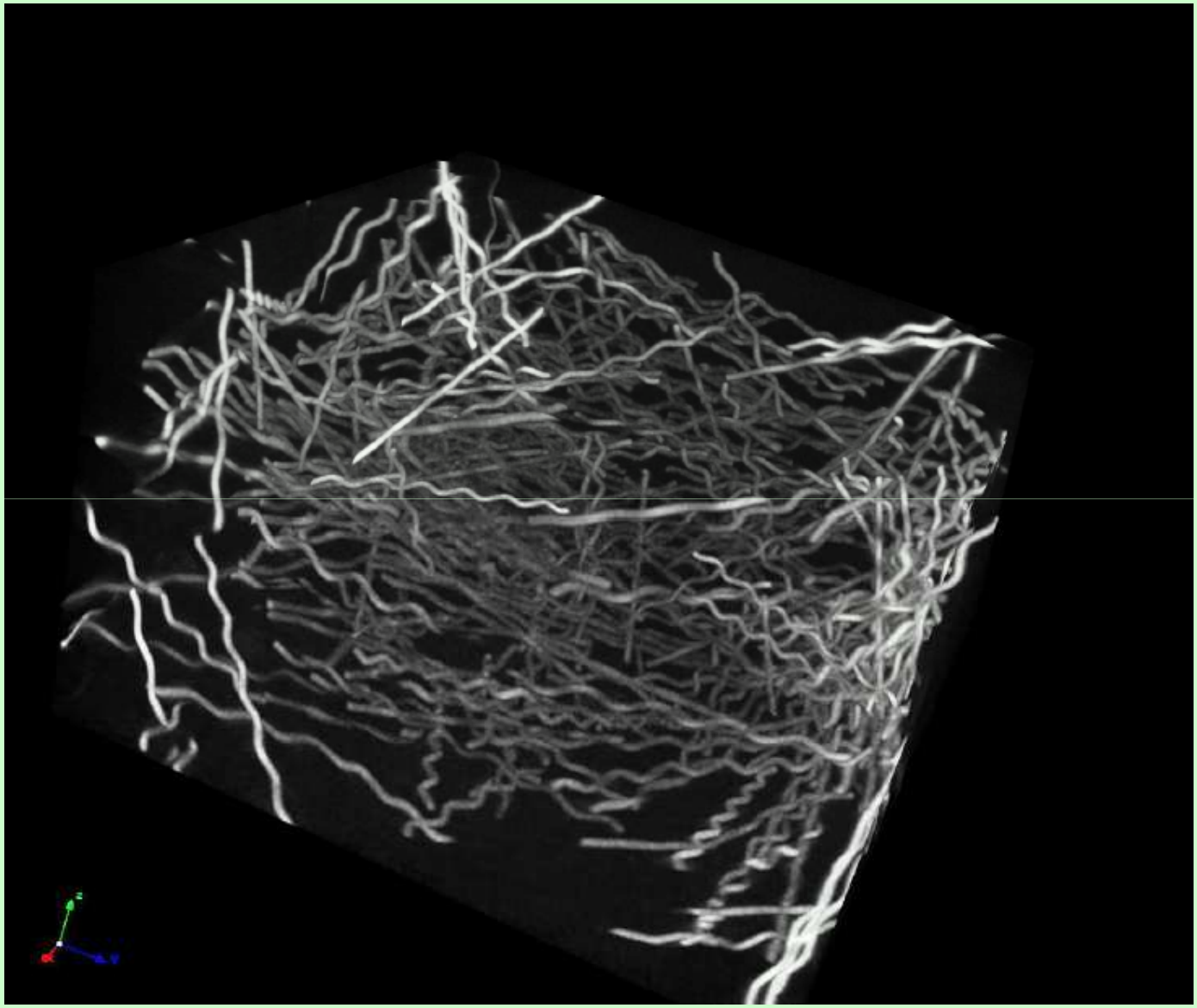




Computer tomography



Computer tomography of fibre reinforced SCC



21th Conference "Rheology of Building Materials„ 29.02 - 01.03.2012, Univ. of Applied Science

THANK YOU FOR ATTENTION

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